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ABSTRACT

Teacher attitudes (inputs) and classroom practices (processes) were used to predict residual student achievement scores (outputs). A combination of three approaches were used to control for student background characteristics and isolate the effects of school variables: (1) a "residual" measure of achievement; (2) an "input-output" or "production function" using both student and school background characteristics as inputs and achievement scores as outputs; and (3) "process-outcome" or "process-product" controls. A causal modeling effort in Phase I of the Seattle School Effectiveness Project in 1979-80 produced a "school effectiveness index," designed to be free of influence from a few major student characteristics (family income, initial achievement and ethnic classification) which are beyond the school's control, yet relate to student achievement gains. Phase II identified school characteristics which are correlated with the index. Phase III findings in 1981-82 were compared with Phase II results in 1980-81, and an explanatory causal model is proposed which examines reading, mathematics and language achievement gains. (Author/CM)

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SCHOOL CHARACTERISTICS RELATED TO STUDENT ACADEMIC GROWTH

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SCHOOL CHARACTERISTICS RELATED TO STUDENT ACADEMIC GROWTH

INTRODUCTION

The last decade has witnessed a surge of research designed to demonstrate that schools have an impact on student achievement and that this impact is due to identifiable school characteristics. That this surge was prompted by the Coleman et al. (1966) and Jencks et al. (1972) studies, which concluded that differences in student achievement are due primarily to family background and associated variables, should not detract from the worth of the research effort. In fact, it is largely due to the findings of Coleman and Jencks that researchers have more consistently recognized the need to control for student background characteristics in order to isolate the effects of school variables.

Three approaches to effecting such control are relevant to the present study. The first is the use of a "residual" measure of achievement. That is, school mean achievement scores are regressed on student background characteristic measures to obtain a predicted mean achievement score. The difference between the actual and predicted mean achievement score for a school is the school's residual score. In studies using residuals, schools with extreme (large positive or negative) residual scores are identified and characteristics of these "outlier" schools are investigated. The investigation usually takes the form of comparing high with low outlier schools or outlier with non-outlier schools on selected characteristics. A good example of the use of this approach is Klitgaard and Hall (1974).

The second approach, termed "input-output" or "production function," also uses regression techniques, but in a different fashion. In input-output studies, both student and school background characteristics are treated as inputs and student achievement scores are treated as outputs. The aim of this approach is to compare the relative contributions to student achievement test variance of the different input variables. Input-output studies vary considerably in the degree to which their methodology permits causal statements to be made about the different input variables. Two of the most causally interpretable of these input-output studies are those of Bidwell and Kasarda (1975) and the Michigan Department of Education (1976), which use path analysis. [Glasman and Biniaminov (1981) offer an excellent review of input-output studies.]

The third approach, termed "process-outcome" or "process-product" controls for student background characteristics, such as socio-economic level, by studying the effects of different classroom practices and teacher behaviors separately for fixed levels of the student background variable(s). Medley (1977) gives a detailed review of the most methodologically sound of such studies. Somewhat more current, but less detailed, reviews of process-product studies can be found in Brophy (1979) and Good (1979).

The relevance of the above approaches here is that the present study uses a combination of all three. Teacher attitudes (inputs) and classroom practices (processes) are used to predict residual student achievement scores (outputs).

The method of analysis used is similar to that used by Bidwell and Kasarda and the Michigan Department of Education, both cited above. Thus, causal statements can be made about the roles of the different input and process variables. The remainder of this section traces the history of this causal modeling effort in Seattle.

Phase I of the Seattle Public Schools' School Effectiveness Project, conducted during the 1979-80 school year, produced a "school effectiveness index," a measure of academic achievement designed to be free of influence from a few, major student characteristics (family income, initial achievement, and ethnic classification) which are beyond the school's control and yet which do relate to student achievement gains. The methods section of this report includes a conceptual description of the index. This rather complex statistical method is presented in detail in a previous paper [Matthews, et al. (1981)] and so will not be exhaustively described here.

During Phase II of the project, conducted during the 1980-81 school year, Seattle's Elementary Education Department and Research and Evaluation Office collaborated to identify and study school characteristics which correlated with the index. Essentially, the 1980-81 study found two school climate variables and six classroom variables to be significantly correlated with achievement gains in reading [Ramey, et al. (1982)].

This Phase III paper describes the 1981-82 School Effectiveness Project and its results, compares these with 1980-81 findings, and proposes a causal model which attempts to explain the interrelationships among various school characteristics and achievement gains in reading, math, and language.

The remainder of the paper includes five sections:

I. Study Objectives - A listing of the five primary objectives.

II. Methods - A conceptual description of Seattle's school effectiveness index, a description of the data gathering process which occurred during the 1981-82 school year and the resulting measurements, plus a description of the analyses performed.

III. Results - A report of the results of analyses performed to date on the 1981-82 data.

IV. Causal Effectiveness Model - A description of the model which posits causal relationships between school characteristics and reading, math, and language index scores.

V. Discussion and Conclusions - A comparison of findings for 1981-82 with those for 1980-81; a discussion of and conclusions drawn from these findings.

STUDY OBJECTIVES

The 1981-82 phase of the School Effectiveness Project was designed to meet five objectives. These included:

A. Replicating the 1980-81 study, refining data-gathering techniques to eliminate previous data limitations.

B. Expanding the study to consider mathematics and language achievement in addition to reading.

C. Building a causal model of school characteristics and their relationship with academic gain.

D. Determining if the same model describes both primary (2, 3) and intermediate (4-6) grade level operations in elementary schools.

E. Producing an observation manual for dissemination to others who wish to document classroom activity.

Methods for addressing the first four of these objectives and results of the efforts are presented in the following paragraphs. The fifth objective, producing an observation manual, will be completed later.

The overall goal of the School Effectiveness Project is to identify those characteristics of Seattle's schools which promote student academic achievement.

METHODS

Achievement Gains Index

For the entire School Effectiveness Project, measurement of student achievement gains is based on a method consisting of the following steps:

- Initial achievement level (the fall test score) is used with economic (free or reduced-price lunch eligibility) and ethnic data (five categories) to predict a spring score for each student in each grade (2 through 6).
- The differences between students' predicted scores and actual spring scores are averaged for each grade within each building.
- Average difference scores are adjusted to equalize grade to grade variability so that scores from different grades can be combined.
- The adjusted scores are averaged across grades within grade level clusters (2, 3 and 4-6) and within schools to produce schoolwide primary and intermediate level index scores.

The purpose of the first two steps is to remove the effects of major variables not under school control so that the resulting index scores more directly reflect the influence of school related variables that are manipulable by teachers and principals. [See Appendix A (p. 22) for a "real life" example showing how the effects of major nonschool variables are removed in computing index scores.] Test scores from fall and spring administrations of the California Achievement Test (CAT) were used to calculate index scores.[1] This report presents the results of relating index scores for Total Reading, Total Math, and Total Language to other school information obtained from classroom observations and teacher surveys.

Classroom Observation

The observation form and procedures for its use were developed from an initial composite of existing observation systems. Observation system development occurred during an intensive three week pilot period which immediately preceded formal use in the 1980-81 study. Reliability of the system was established near the end of the pilot period when randomly chosen pairs of observers were compared for agreement in their coding of classroom activities. Reliability coefficients for individual classroom activities ranged from .80 to .92, with a

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1 Neither the one year time period nor the use of the CAT in developing an index are essential features of the approach taken in this study. Longer time spans (two or more school years) and other measures (including criterion referenced tests) are also appropriate. However, expanded time periods were not deemed feasible due to the high mobility of Seattle's students and staff and the CAT is at present the only test administered consistently in both fall and spring.

median coefficient of .85. The same observers, selected elementary level teachers, who participated in the development of the system served as classroom observers in the 1980-81 study.

For the 1981-82 study, the observation form underwent slight revision to allow observers to indicate subject matter of observed lessons. Observers who were new in 1981-82 were trained by experienced observers during a one week series of training/refresher sessions conducted at a nonstudy school.

A sample of 25 schools representing the full range of 1980-81 index scores was selected for study and a random procedure was used to select classrooms for observation within schools. Twelve observers assumed responsibility for conducting observations in the 216 classroom sample, for which there were two observations of approximately 30 minutes per classroom. The only absolute rule, designed to reduce any possibility of observer bias, was that the two observations in a given classroom were to be conducted by different observers. Observations began in late January 1982 and were completed in March.

Variables derived from the observation form fall into two general categories:

Student Activities	Teacher Activities
Average percent of student time spent in:	Average percent of teacher time spent in:
non-academically engaged behavior[2]	interactive instruction
one-to-one setting with teacher	lecture
small group setting with teacher	one-to-one interaction
total group setting with teacher	small group interaction
seat work	total group interaction
other activities related to subject being taught	organization
other activities not related to subject being taught	discipline
being tested[3]	monitoring
	non-interactive activity

Definitions and examples of all these variables and a copy of the observation form may be found in the glossary, Appendix B (pp. 23-26).

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2 For purposes of clarity, "average percent of student time spent in non-academically engaged behavior" was subtracted from 100 to give "average percent of student time spent academically engaged." The latter variable was used in all analyses.

3 It should be noted that classroom observations were scheduled to avoid both fall and spring standardized testing periods. Thus any observations of students being tested were necessarily of students taking teacher-made or teacher selected tests.

Teacher Survey

The opinionnaire used to survey teachers in 1980-81 was modified for use in 1981-82. Demographic items were deleted and three new scales were added. The survey was designed to obtain teachers' opinions concerning building characteristics such as principal style, expectations for students, and the effectiveness of the building's instructional program. Thus the opinionnaire is comprised of a number of scales, each of which is composed of a number of items. Reliability of the scales was determined by calculating Cronbach's coefficient alpha (a measure of internal consistency) for each of the scales. Alpha coefficients ranged from .87 to .97, with a median coefficient of .93.

The Director of Elementary Education asked principals at sample schools to assign one staff member to distribute and collect teacher opinionnaires at a schoolwide staff meeting. This took place during early spring, about two weeks after spring vacation and before Reduction-In-Force notices were distributed by the District. The process resulted in nearly 100% returns on opinionnaires.

The following variables were measured by scales formed from the teacher survey.

Principal as an academic leader
Principal as a personnel manager
Building climate
Teachers' expectations for students
Usefulness of the district curriculum
Coordination among building's programs
Effectiveness of building's instructional program
Clarity of definition and consistency of building's standards for instruction and conduct

For definition of each of the variables, see the annotated survey of Appendix C (pp. 27-29).

Analyses

Initial correlational analyses of the data as well as a review of research literature led to the decision to treat second and third grade students as a separate population from fourth through sixth grade students in all analyses. (There were not enough cases to permit this breakdown in 1980-81.) Accordingly, separate analyses were conducted for the two grade level clusters.

These analyses were actually a three step sequence performed for each of the two grade level clusters and for each subject area, reading, math, and language. The first step was to combine the variables listed in the two preceding sections into groups, or factors, so that variables in one group correlate highly among themselves and to a minimal extent with variables in other groups. The purpose of this operation (factor analysis) was to reduce the number of variables to a smaller and more manageable number of factors, which have more explanatory power than the variables taken one at a time. Subsequent analyses relate differences on the resulting factors to index score differences.

A useful feature of the above analysis is that it produces a score on each factor for each case[4] in the sample. This feature permitted conducting the second step, which was to compare factor scores of those cases having the highest and lowest index scores in a given subject area.[5] This high versus low group comparison is comparable to one in which coefficients of correlation between factor scores and index scores are computed. It was chosen because it lends itself to a graphic display of results.

The resulting graphs show whether certain factors, defined by specific variables, distinguish between high and low index score groups. However, they do not show the relative weight of each variable in defining a factor, the extent to which the factors themselves are correlated, nor the manner (direct and/or indirect) and degree to which the factors relate to the index scores. This information is provided by the third and last in the sequence of analyses, the construction of a model that posits causal relationships between school characteristics, factors, and index scores. The methodology, termed LISREL, (Joreskog and Sorbom, 1981) used in this construction is most easily discussed in terms of real examples. The examples employed will be the models constructed to fit the data of this study. These models are described in the Causal Effectiveness Models section of this report.

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4 A "case," in these analyses, is a particular grade-within-school combination. For the primary level cluster, two distinct cases might be second graders at School A and third graders at School B. Similarly, for the intermediate grade level cluster, three distinct cases might be fourth graders at School B, fifth graders at School C, and sixth graders at School C. There were 36 cases in the second and third grade level cluster and 47 cases in the fourth through sixth grade level cluster.

5 The high and low groups were formed by ranking the index scores of all the cases in a grade level cluster. Separate rankings were performed for reading, math, and language index scores. The high reading group consisted of the six cases whose reading index scores ranked first through sixth. The low reading group consisted of the six cases having the lowest six reading index scores. For math and language, the same procedure was used with math and language index scores, respectively, used as the basis for ranking.

RESULTS

Primary Grades (Two and Three)

Factor defining variables. At the primary level, for reading, two major groups of variables, or factors, were identified. Each of these two factors was defined by three of the school characteristic variables. No factors were identified for math and language because these two subjects lacked correlates among the school characteristic variables. The two reading factors and the school characteristic variables that define them are listed below.

Direct Instruction	Teacher Control
Average percent of teacher time spent in:	Average percent of teacher time spent in:
1. Interactive Instruction	1. Organization
2. Monitoring	2. Lecture
Average percent of student time spent in:	Average percent of student time spent in:
3. Small or total group setting with teacher	3. One-to-one setting with teacher

Figure 1 (p. 32) shows the differences between the average factor scores of the extremely high and extremely low reading index score groups. The direction of differences indicates that the high reading group scored higher on the direct instruction factor and lower on the teacher control factor than did the low reading group. In other words, a relatively large amount of time devoted to direct instruction tends to be associated with high reading index scores while a relatively large amount of time spent on teacher control activities tends to be associated with low reading index scores.

Redundant variables. There were four other school characteristic variables, three from the classroom observation instrument and one from the teacher survey, that correlated with factor defining variables.[6] Although these four variables

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6 "Percent student time spent academically engaged" correlated positively with two of the three direct instruction variables, "teacher time spent in interactive instruction" and "student time spent in small or total group setting with the teacher." "Percent student time spent academically engaged" correlated negatively with all three of the teacher control variables. "Percent student time spent in seatwork" was correlated with all three direct instruction variables, "teacher time spent in interactive instruction" (negative correlation), "teacher time spent monitoring" (positive coorelation), and "student time spent in small or total group setting with the teacher" (negative correlation). "Percent student time spent in seatwork" correlated positively with "student time spent in one-to-one setting with the teacher." "Percent student time being tested" was also correlated with all three direct instruction variables. It correlated negatively with "teacher time spent in interactive instruction," positively with "teacher time spent monitoring," and negatively with "student time spent in small or total group setting with the teacher." The teacher survey variable, "teachers' expectations for students," correlated positively with all three teacher control variables. None of the other teacher survey variables was significantly correlated with any of the factor defining variables.

were correlated with the factor defining variables, they were not included in the factor defining set because the variables listed above better defined the two factors. That is, inclusion of any or all of these additional variables reduced the "goodness of fit" of the model to be described in the next section. These four variables are, in an explanatory sense, redundant to those already included.

In practical terms, however, it should be noted that a large "percent of student time spent academically engaged" is associated with high scores on the direct instruction factor and low scores on the teacher control factor. Moreover, the pattern of relationships for "percent student time spent in seatwork" and "percent student time being tested" is to be expected since both activities are non-interactive, involving the teacher primarily in a monitoring role. However, the finding that high "teachers' expectations for students" is associated with high scores on the teacher control factor was not expected, nor are its practical implications clear.

Unrelated variables. None of the variables listed below correlated with either reading index scores or any variables in the above factor-defining set.

Average percent of student time spent in:
- other activities related to subject being taught
- other activities not related to subject being taught

Average percent of teacher time spent in:
- discipline
- non-interactive activity

Principal as an academic leader
Principal as a personnel manager
Building climate
Teachers' expectations for students
Usefulness of the district curriculum
Coordination among building's programs
Effectiveness of building's instructional program.
Clarity of definintion and consistency of building's standards for instruction and content.

To give another picture of the relationships among reading index scores, factor-defining variables, factor scores, and the four "redundant" variables, Table 1 (p. 41) shows a breakdown of average scores on each of these measures by case (grade within school). The table is set up so that cases are listed from 1 to 36 in descending order of reading index scores. In addition, Table 2 (p. 42) shows the correlations among the same measures. For archival purposes, correlations involving "unrelated" variables are also included in Table 2.

Intermediate Grades (Four through Six)

Factor defining variables. At the intermediate level, three factors were identified which were common to all three subjects, reading, math, and language. The three factors and the school characteristic variables that define them are listed below.

Instruction Versus Management	Seatwork Versus Total Group Participation	Standards/Expectations
Average percent of teacher time spent in:	Average percent of student time spent in:	1. Clarity and consistency of building's standards
1. Interactive instruction	1. Seatwork	2. Teachers' expectations for students
2. Monitoring (negative weight)	2. Total group setting with teacher (negative weight)	
3. Organization (negative weight)		

Only one of the three factors, standards/expectations, was directly related to the three subject area index scores. However, all three factors were related in varying degrees, to "percent student time spent academically engaged," which in turn was related to index scores. Figures 2A, 2B, and 2C (pp. 33-35) show the differences between the average standards/expectations factor scores and the average "percent student time spent academically engaged" scores of high and low reading, math, and language index score groups, respectively.

Comparing Figures 2A through 2C, it can be seen that the separation between high and low index score groups on both the standards/expectations factor and "student time spent academically engaged" is greatest for math and least for language. In other words, high scores on both the standards/expectations factor and "student time spent academically engaged" are associated with high index scores, and the degree of association varies with subject matter--greatest for math and least for language.

Figure 3 (p. 36) shows the differences between the average factor scores for groups formed on the basis of having high or low scores on the variable 'average percent student time academically engaged.'[7] The direction of differences in Figure 3 indicates that the high 'academically engaged' group had higher scores on all three factors than did the low 'academically engaged' group. In other words, a large amount of teacher time spent on instruction relative to time spent on management activities, a large amount of seatwork relative to non-seatwork total group activities, and clear and consistent building standards and high teacher expectations for students are associated with a high level of student time spent academically engaged. The opposite factor scoring pattern is associated with a low level of student academic engagement time.

Redundant variables. There were ten other school characteristic variables, six from the teacher survey and four from the classroom observation instrument, that correlated with factor defining variables. The six survey variables were "principal as an academic leader," "principal as a personnel manager," "building

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7 The groups, consisting of six cases each, were formed in the same manner as were the high and low index scores groups; i.e., cases were ranked on the basis of their average score on the 'not academically engaged' variable and the six highest and lowest were selected for comparison.

climate," "usefulness of the district curriculum," "coordination among building's programs," and "effectiveness of building's instructional program." Each of these variables, especially "principal as an academic leader," correlated positively with "clarity and consistency of building's standards."

The four classroom observation variables that correlated with factor defining variables were "percent student time spent in small group or one-to-one setting with the teacher," "percent teacher time spent lecturing," "percent teacher time spent in discipline," and "percent student time spent being tested."[8]

These ten variables were not included in the list of factor defining variables because the variables already listed better defined the factors. That is, inclusion of these ten additional variables as factor definers reduced the "goodness of fit" of the model to be described in the next section. These ten variables are, in an explanatory sense, redundant to the measures already included.

In practical terms, however, it should be noted that teachers' positive view of the principal as an academic leader, as well as a high score on each of the remaining survey variables, is associated with a high degree of clarity and consistency of a buildings' standards. Moreover, a large percent of "teacher time spent in discipline" is associated with a low level of "teachers' expectations for students." In addition, a large "percent of student time spent in a small group or one-to-one setting with the teacher" is associated with high scores on both the instruction versus management and the standards/expectations factors and low scores on the seatwork versus total group participation factor.

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8 "Percent student time spent in small group or one-to-one setting with the teacher" was correlated with all three instruction versus management factor defining variables, "teacher time spent in interactive instruction" (positive correlation), "teacher time spent monitoring" (negative correlation), and "teacher time spent in organization" (negative correlation). "Percent student time spent in small group or one-to-one setting" also correlated positively with both of the standards/expectations factor defining variables and negatively with "student time spent in total group setting." "Percent teacher time spent lecturing" was correlated with both of the seatwork versus total group participation factor defining variables, "student time spent in seatwork" (negative correlation) and "student time spent in total group setting" (positive correlation). "Percent teacher time spent lecturing" also correlated negatively with "teacher time spent in interactive instruction." "Percent teacher time spent in discipline" correlated negatively with "teachers' expectations for students," one of the two standards/expectations factor defining variables. "Percent student time spent being tested" was correlated with two of the three instruction versus management factor defining variables, "teacher time spent in interactive instruction" (negative correlation) and "teacher time spent monitoring" (positive correlation). "Percent student time spent being tested" also correlated negatively with "student time spent in total group setting with the teacher."

The pattern of relationships for "percent teacher time spent lecturing" is to be expected since lecture is a non-interactive mode of instruction, usually conducted in a total group setting with no seatwork involved. Likewise, the pattern of relationships for "percent student time spent being tested" (consistent with that found for the primary grades) is to be expected since being tested is a non-interactive student activity, involving the teacher primarily in a monitoring role.

Unrelated variables. None of the variables listed below correlated with either index scores or any variables in the factor-defining set.

Average percent of student time spent in:	Average percent of teacher time spent in:
other activities related to subject being taught	non-interactive activity
other activities not related to subject being taught	

Another picture of the relationships among index scores, factor-defining variables, factor scores, and the eight "redundant" variables is shown in Table 3 (pp. 43-44). Table 3 gives a breakdown of average scores on each of these measures by case (grade within school) for the intermediate level. The table is set up so that cases are listed from 1 to 47 in descending order of reading index scores as they are in Table 1. (There is no necessary correspondence between the case numbers in Tables 1 and 3.) In addition, Table 4 (pp. 45) shows the correlations among the same measures. For archival purposes, correlations involving "unrelated' variables are also included.

CAUSAL EFFECTIVENESS MODELS

Primary Grades (Two and Three)

Figure 4 (p. 37) shows the model found to best describe the interrelations among school characteristics variables, factors, and index scores for the primary grades.[9] In this model the two factors, direct instruction and teacher control, have the status of direct causal factors. This is indicated by the one-way arrows which point to the outcome measure, the reading index score.

From Figure 4, it can be seen that the two factors differ in their degree of influence on the reading index score. This is indicated both by the different sizes of the circles representing the factors and the weights (partial correlation coefficients) associated with the right-pointing arrows. By far the larger value, .29, is that describing the impact of direct instruction on reading index scores. It is more than nine times the absolute value of the weight, -.03, which describes the influence of teacher control on reading index scores. The two factors also differ in the direction of their effect on reading scores. The positive weight for direct instruction indicates a positive impact; i.e., larger amounts of time spent on direct instruction produce higher reading index scores than do smaller amounts. The negative weight for teacher control indicates a negative impact; i.e., larger amounts of time spent on teacher control activities tend to produce lower reading index scores than do smaller amounts of time.

The two-way arrow between the factors indicates that the factors are correlated, but no causal primacy is assumed. The size and sign of the (zero-order) correlation, -.50, indicates that classrooms high in teacher control tend to be low in direct instruction and vice versa.

The left pointing arrows linking the factors to the school characteristic variables show which characteristics define each factor. (This was also shown in the Results section.) The model also assigns to these defining characteristics the role of observable measures, or functions, of the otherwise unobservable factors. Both the size of the rectangle representing a characteristic and the weight associated with a factor-characteristic linkage indicate the relative prominence of the characteristic as a measure of a factor. Thus "small or total group setting" with a weight of 14.7 is the principal measure of direct instruction, followed closely by "interactive instruction" with a weight of 12.9. "Monitoring," with a weight of 5.1, is a relatively weak measure of direct instruction. However, it should be noted that the relative prominence of each characteristic in measuring a factor is in itself a way of defining, or giving meaning to, the factor.

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9 The least squares solution option of the LISREL program was used to develop the models for both primary and intermediate grade levels. Although a maximum liklihood solution option is available in the program, data did not meet the distribution assumptions required by that option. The solution used the covariance (rather than the correlation) matrix of the input variables and is presented here in its standardized form.

Two useful statistics are produced by the analysis used to construct a model such as that shown in Figure 4. The first is a measure of goodness of fit of the model to the data. This statistic reaches a maximum of 1.0 when there is a perfect fit. The value obtained for the model of Figure 4 is .999. The other statistic is the percent of variance in the outcome measure explained or accounted for by the model. The value obtained for the above described reading model is 9.4%. That is, the best fitting model that could be found using the data at hand accounted for 9.4% of the variability in reading index scores at the primary grade level. While this value is small compared to those found at the intermediate grade level, it does indicate that some of the index score differences between schools are attributable to the variables under investigation.

Intermediate Grades (Four through Six)

Figures 5A (reading), 5B (math), and 5C (language), (pp. 38-40, respectively), show the models found most descriptive of the interrelations among school characteristics, factors, and index scores for fourth through sixth grade students. In these models, two of the factors, instruction versus management and seatwork versus total group instruction, have the status of indirect causal factors. Their effect on index scores is through their influence on "percent student time spent academically engaged." The latter variable has a direct effect on index scores. The third factor, standards/expectations has both a direct and indirect effect on index scores. Its indirect effect is similar to that of the other two factors; it influences "percent student time spent academically engaged;" but, unlike the other two factors, it also impacts index scores independently of its influence on "percent student time spent academically engaged." In other words, high scores on all three factors produce a high level of student academic engagement time. This high level of student academic engagement time, together with clear/consistent building standards and high teacher expectations for students, produces high index scores.

Figures 5A through 5C, show that the three factors differ in the extent to which they affect student academic engagement time. The difference is reflected in both the size of the circles representing the factors and the weights (partial correlation coefficients) associated with the arrows that point from the factors to "student time spent academically engaged." The largest weight is that associated with seatwork versus total group participation. Its value, .39, is somewhat larger than that, .25, for instruction versus management, which in turn is five times the weight, .05, for standards/expectations.

Comparing Figures 5A through 5C, it can be seen that the three subject area index scores have different degrees of dependence on student academic engagement time, a "filter" through which each factor influences index scores. The degree of this dependence is indicated in Figures 4A through 4C by the weight (a partial correlation coefficient) associated with the arrow pointing from "student time spent academically engaged" to each of the three subject area index scores, .27 for reading, .30 for math, and .20 for language. Thus, math index scores are most heavily dependent on student academic engagement time; reading index scores are nearly as dependent; and language index scores are least dependent on student academic engagement time.

However, the three subject area index scores have nearly the same degree of dependence on clear/consistent building standards and high teacher expectations

for students. This degree of dependence is indicated in Figures 5A through 5C by the weight (a partial correlation coefficient) associated with the arrow pointing from "standards/expectations" to each of the three subject area index scores, .29 for reading, .29 for math, and .31 for language.

The two-way arrows among the three factors have the same interpretation as for the primary grades model. They indicate that each pair of factors is correlated, but no causal primacy of one over another is assumed. The size of the correlation between pairs indicates the strength of their association. Thus, the correlation of -.36 between instruction versus management and seatwork versus total group instruction indicates that there is a moderate tendency for classrooms high in amount of instruction to be low in amount of seatwork and vice versa. Likewise, the correlation of .27 between instruction versus management and standards/expectations indicates that classrooms high in amount of instruction tend to a moderate degree, to be high in standards and expectations for students. The remaining correlation of .05 between seatwork versus total group instruction and standards/expectations indicates a negligible tendency for classroom high in amount of seatwork to be high in standards and expectations, and vice versa.

The left-pointing arrows joining the factors with the school characteristic variables show which characteristics define each factor. (This was also indicated in the Results section.) As with the primary grades model, both the size of the rectangle representing a characteristic and the weight associated with a factor-characteristic linkage indicate the relative prominence of the characteristic as a measure of a factor. Thus, "interactive instruction" with a weight of 27.6 is the principal measure of instruction versus management. The negative weights for "monitoring" and "organization" indicate that these two variables measure the opposite, or management, aspect of the instruction versus management factor. The more prominent measure of the management aspect is "monitoring," with a weight of -8.4, which is over three times the weight, -2.6, for "organization."

Again, it should be noted that the relative prominence of, and the sign associated with, each characteristic is in itself a way of defining or giving meaning to a factor. Thus the remaining two factors may be interpreted in a fashion similar to the interpretation of the instruction versus management factor.

Two important considerations remain in determining the model's worth in describing the data. The first is its "goodness of fit." As indicated earlier, the analysis used to construct the model produces a goodness of fit statistic, which reaches a maximum of 1.0 when there is a perfect fit of the model to the data. The value obtained for all three models of figure 4 is .994. As in the case of the primary grades model, this indicates a highly satisfactory fit.

The other consideration in determining the model's worth is how much variance in the outcome measure it accounts for or explains. The percentages of variance accounted for by the reading, math, and language models of figures 5A through 5C are 16.3%, 18.0%, and 13.9%, respectively. While these values are not extremely large, they compare favorably with others reported in the school effectiveness literature (Inman, 1977). Moreover, they indicate that a meaningful portion of the index score variability among schools is attributable to the variables under consideration.

DISCUSSION AND CONCLUSIONS

A useful point of departure for discussing the findings of the 1981-82 (Phase III) School Effectiveness Project is to point out those features that distinguish this Phase III effort from that of 1980-81 (Phase II). There are three major differences between the two year's efforts in the treatment of the data, and hence the kind of conclusions that can be drawn.

First, the 1981-82 analyses differed from those of 1980-81 in that data from the primary (grades 2 and 3) and intermediate (grades 4 through 6) elementary grade levels were treated separately. Initial correlational analyses of the data as well as review of research literature indicated that what might be an important characteristic for one grade level cluster might not be so for the other. In 1980-81 there were insufficient cases to make this split.

Second, school characteristic variables were combined into groups, or factors, in the 1981-82 analyses. This was done in order to reduce the number of variables, which was considerable, to a smaller and more manageable set of factors having more explanatory power than the variables taken one at a time. It should be noted, that, taken singly, very few variables were highly correlated with index scores at either the primary or intermediate grade levels.

Third, LISREL, a relatively new analytic technique designed to permit making causal statements about the relationships among school characteristics, factors, and index scores, was used. This feature is probably the most important difference between the analyses of 1980-81 and 1981-82. The simple correlational analyses of 1980-81 permitted only statements of association between school characteristic variables and index scores, an approach with low explanatory power compared with that of the LISREL mode of analysis.

The 1981-82 analyses identified two factors that at least partially account for reading index score differences at the primary grade level. (Correlates of math and language index scores were lacking at this grade level.) The factor having the largest impact on reading index scores was direct instruction, measured in decreasing size of weight by the three classroom observation variables: percent student time spent in either a small or total group (as opposed to one-to-one) setting with the teacher, percent teacher time spent in interactive (non-lecture) instruction, and percent teacher time spent monitoring classroom activities. The direct instruction factor was positively related to reading index scores; i.e., high scores on this factor produced high reading index scores.

The other factor that helped account for reading index score differences at the primary grade level was teacher control, measured in decreasing size of weight by the three classroom observation variables: percent teacher time spent in organizational activities, percent teacher time spent lecturing, and percent student time spent in a one-to-one setting with the teacher. The teacher control factor was negatively related to reading index scores; i.e., high scores on this factor produced low reading index scores. The teacher control factor is also negatively correlated with the direct instruction factor.

Although they proved redundant in the model that justified the above causal statements for the primary grade level, three additional classroom observation variables and one teacher survey variable correlated with one or more of the "causal" variables. The pattern of correlations exhibited by the three classroom observation variables, student time academically engaged, student time in seatwork, and student time being tested, is most economically explained by classroom logistics. That is, when the teacher is instructing the whole class in an interactive fashion, students tend to stay academically engaged or "on-task." On the other hand, one-to-one teacher-student contacts occur most frequently when students are doing seatwork; and, while the teacher attends to an individual student, the remainder of the class is more likely to become "off-task." Since the testing situation is similar to seatwork (where the teacher interacts with students primarily in a monitoring role), it is to be expected that student time being tested, like student time in seatwork, correlates negatively with teacher time in interactive instruction, positively with teacher time monitoring, and negatively with student time in small or total group setting with the teacher.

The unanticipated finding was that scores on the teacher survey variable, teachers' expectations for students, correlated positively with teacher time in organization, teacher time in lecture, and student time in a one-to-one setting with the teacher, all three variables that define the teacher control factor. Since the teacher control factor correlates negatively with reading index scores, this is a potentially important finding; but it is one for which the authors have yet to generate a plausible explanation.

Similar analyses at the intermediate grade level identified two factors that indirectly influence and one factor that both directly and indirectly influences reading, math, and language index scores. The influence of all three factors is direct upon student academic engagement time which in turn directly influences index scores.

The factor having the largest impact on intermediate grade level student academic engagement time was seatwork versus total group participation, measured in decreasing size of weight by the two observation variables: percent student time spent in seatwork (large positive weight) and percent student time spent in total group setting (moderate negative weight). The signs of the two weights indicate that a large percent of time spent in seatwork promotes student academic engagement time while a large percent of student time spent in a large group setting inhibits student academic engagement time.

The factor having almost as large an impact on intermediate grade level student academic engagement time as the preceding was instruction versus management, measured in decreasing size of weight by the three observation variables: percent teacher time spent in interactive (non-lecture) instruction (very large positive weight), percent teacher time spent monitoring classroom activities (moderate negative weight), and percent teacher time spent in organizational activities (small negative weight). The signs of the three weights indicate that a large percentage of interactive instruction promotes student academic engagement time while a large percent of teacher time spent either monitoring or organizing inhibits student academic engagement time. With regard to teacher time spent organizing, it should be noted again that observations took place during the middle of the school year. Studies by Emmer et al. (1980) and

Evertson and Anderson (1979) indicate that teachers who spend considerable time establishing rules and procedures at the beginning of the school year have less need to perform these organization/management activities later in the year.

The factor having the least impact on intermediate grade level student academic engagement time was standards/expectations, measured in decreasing size of weight by the two teacher survey variables: clarity/consistency of building's standards and teachers' expectations for students. However, standards/expectations was the only factor having a direct influence on index scores; this influence is positive and substantial for all three subject areas.

Although they proved redundant in the model that justified the above causal statements for the intermediate grade level, six teacher survey variables correlated positively with clarity/consistency of building's standards, the highest correlation being that for "principal as an academic leader." Thus, although the principal's academic leadership does not appear explicitly as a causal factor, it could very well play a "behind the scenes" role in influencing an important school policy, clear and consistent standards, which in turn impacts index scores both directly and by increasing student academic engagement time.

Two of the four "redundant" classroom observation variables, student time being tested and teacher time lecturing, showed patterns of correlations with the factor defining variables that are explainable in terms of classroom logistics. However, the remaining two observation variables, student time in a one-to-one or small group setting with the teacher and teacher time spent in discipline, showed more noteworthy patterns of correlations. The pattern for the former indicates that a one-to-one or small group setting, compared to a total group setting with the teacher is associated with higher levels of student engagement time and hence higher index scores. Also noteworthy is the fact that teacher time spent in discipline is negatively correlated with teachers' expectations for students. In other words, teachers who have higher expectations for their students spend less time disciplining them than do teachers who have low expectations for their students.

On the whole, the 1981-82 results are quite consistent with those for 1980-81. Where discrepancies occur it is because of differences between the primary and intermediate grade levels. Specifically, the major discrepancies involve the three variables, teacher time spent monitoring, student time spent in a one-to-one setting with the teacher, and student time spent academically engaged. In 1980-81, when grade level differences were not taken into consideration, the first two variables were found to be negatively related to reading index scores and student time spent academically engaged was found to be positively related to reading index scores.

In the 1981-82 analysis, teacher time spent monitoring partially defined a factor that positively influenced reading index scores at the primary grade level. At the intermediate grade level, teacher time spent monitoring had a negative weight in defining a factor that positively influenced index scores. It would appear from these results, that, at the primary grade level, a certain amount of monitoring has a positive, constructive role in the instructional process. At the intermediate grade level, monitoring appears to become a management activity that gets in the way of instruction.

Likewise, in the 1981-82 analysis, student time spent in a one-to-one setting with the teacher partially defined a factor that negatively influenced reading index scores at the primary grade level. At the intermediate grade level, student time spent in a one-to-one setting did not directly emerge as a causal variable. Rather, student time spent in a total group setting had a negative weight in defining a factor that positively influenced index scores. It would appear from these results that the optimal setting for students at the intermediate grade level is either one-to-one or small group.

Also, in the 1981-82 analysis, student time spent academically engaged played a tangential role at the primary grade level. It correlated positively with a factor that positively influenced index scores and negatively with a factor that negatively influenced index scores, but it did not have a direct relationship with index scores. At the intermediate grade level, student time spent academically engaged played a central role, that of a "filter" through which two classroom process factors and one teacher input factor influenced index scores.

Otherwise, the results for 1981-82 (Phase III) bear out the findings of the 1980-81 (Phase II) study. Moreover, the distinctive features of the Phase III study, summarized at the beginning of this section, justify a causal interpretation of the two years' findings.

The percent of school to school variation in index scores that is explained by the 1981-82 causal models deserves further comment. While these percentages are large enough to warrant meaningful recommendations for school improvement, particularly at the intermediate grade level, they are also small enough to suggest that important variables have not been considered. This is not surprising since the study focused on relatively broad categories of classroom activities and sought information on how often these activities occur. It did not seek information on how well or in what manner the activities are accomplished.

For example, studies of strategies used in interactive instruction indicate that frequent use of questions and signals (Carnine and Fink, 1978), continuous teacher cueing of appropriate student behavior (Kounin and Gump, 1974), and structured transitions (Arlin, 1979) promote high levels of student involvement (academic engagement). Assignment of challenging and varied seatwork has been found to have a similar positive effect on student involvement (Kounin, 1970). Inclusion of measures of these qualitative aspects of global classroom activities would most likely enhance the explanatory power of a model designed to account for between-school differences in student academic achievement growth.

Another source of between-school variation not accounted for by the model described herein is that attributable to teacher practices interacting with student characteristics. For example, Brophy (1979) reports the fast paced instruction and continuous communication of high expectations and standards is more effective with high socio-economic status/high-ability students than with low socio-economic/low-ability students. The latter students profit more from warmth, praise, and encouragement than do the former. Medley's (1977) review of process-outcome research includes many studies which demonstrate an interaction between teaching practices and student socio-economic status. Provision for interactions between process variables and student characteristics is a logical next step in building a model that more completely accounts for between-school variation in student academic achievement growth. Such a course will be pursued in Phase IV of the present study.

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APPENDIX A

AN ILLUSTRATION OF HOW INDEX SCORES FUNCTION

The following example illustrates how the effects of initial achievement level, economic status, and ethnic group membership are removed in computing index scores. The example uses actual 1981-82 fourth grade data.

At School A, the average spring Total Reading raw score was 49, two points above the district average of 47. However, School A's reading index score was below the district average reading index score. This disparity occurred because School A's average spring score was less than that (50) predicted for it on the basis of its average fall score, which was 45 (two points above the district average of 43); its percentage of students eligible for free or reduced-price lunch, which was eight (30 points below the district's 38%); and its percentage of ethnic minority students, which was four (31 points below the district's 35%).

At School B, the average spring Total Reading raw score was 44, three points below the district average. But School B's reading index score was as much above the district average index score as School A's was below. This occurred because School B's average spring score was greater than that (43) predicted for it on the basis of its average fall score, which was six points below the district average; its percentage of students eligible for free or reduced-price lunch, which was only three points below the district percentage; and its percentage of ethnic minority students, which was only two points below the district percentage.

In sum, School A's values on all three background measures combined to produce a high predicted score, which was not attained. As a result, School A had a low index score. On the other hand, School B's initial (fall) score was the single factor operating to produce a low predicted score since School B's values on the other two background measures were approximately the same as the district's. Because School B's actual spring score exceeded that predicted, School B had a high index score.

APPENDIX B

GLOSSARY OF ACTIVITIES RECORDED DURING CLASSROOM OBSERVATION

STUDENT ACTIVITIES*

Not Academically Engaged - Student(s) not engaging in any of the activities listed below; e.g., cleaning desk, doodling, sharpening a pencil.

Groups with Teacher:

One-to-one Setting - individual student conferring with the teacher; e.g., talking with or listening to the teacher on an academically related matter.

Small Group Setting - Several students conferring with the teacher; i.e., talking with or listening to the teacher on an academically related matter, as a group distinct from the remainder of the classroom.

Total Group Setting - Classroom as a whole listening to or interacting with the teacher on an academically related matter.

Seat Work - Student(s) doing schoolwork at their desks or tables; e.g., working on a vocabulary exercise handout.

Other Activities:

Related to Subject Being Taught - Student(s) not working on teacher assigned task but engaged in activity related to subject being taught; e.g., reading a library book after completing assigned reading task.

Not Related to Subject Being Taught - Student(s) working on neither a teacher assigned task nor a related activity; e.g., working on a math problem during a reading class.

Being Tested - Student(s) taking teacher-made or published tests, usually the former. (No observations were made during fall or spring CAT administration periods.)

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* These activities are mutually exclusive; i.e., a given student at a given time can be tallied in only one activity category.

TEACHER ACTIVITIES*

Instruction:

Interactive Instruction - Teacher using any of a variety of techniques that require active participation of student(s); e.g., discussing a math concept by having students give examples.

Lecture - Teacher alone speaks, with little or no active student participation.

Use of Teaching Aids - Not analyzed; data unreliable.

Groups:

One-to-One Interaction - Teacher involved with only one student; e.g., explaining a math concept to an individual student.

Small Group Interaction - Teacher involved with several students, but not entire class; e.g., discussing a group science project with members of that group.

Total Group Interaction - Teacher involved with the classroom as a whole; e.g., showing slides and answering students' questions.

Classroom Management:

Organization - Teacher performing noninstructional tasks such as passing out books or papers, taking lunch count, moving chairs, etc.

Discipline - Teacher giving response to student(s) behavior; e.g., having student put head on desk, calling out "offender's" name, commending students who are behaving appropriately.

Monitoring - Teacher observing students as they perform assigned tasks; e.g., walking through aisles, inspecting, and briefly commenting on students' work.

Non-Interactive Activity - Teacher performing such activities as correcting papers, cleaning desk, sitting at desk waiting for students to finish an assignment, etc.

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* The three group size categories are not mutually exclusive of the two instruction and three management teacher activity categories. That is, a teacher might be checked as engaged in any one of the five instruction or management categories and also checked in any one of the three group size categories; as, for example, when the teacher is engaged in interactive instruction with a small group.

OBSERVER # _____ (4-5)

TODAY'S DATE (M/D) _____ (6-9)

BUILDING _____ (10-12)

ROOM _____ (13-16)

GRADE LEVEL(S) _____ (17-22)

TIME RANGE (nearest hour) _____ (23-24)

ADULTS IN ROOM _____ (25)

STUDENTS IN ROOM _____ (26-27)

WHEN OBSERVATION STARTED _____ (28)
(1=Started at beginning of period; 2=Started at a time other than the beginning of period)

FIRST OR SECOND OBSERVATION ('1' or '2') _____ (29)

SUBJECT MATTER _____ (30)
(verbal=1; numeric=2; both=3)

1 (80)

CLASSROOM SKETCH (1)

CLASSROOM SKETCH (2)

			STUDENTS								TEACHER										
				GROUPS WITH TEACHER				OTHER ACTIVITIES			INSTRUCTION			GROUPS			CLASSROOM MANAGEMENT				
TIME	GROUPS	# in Group	Not Academically Engaged	Total Group	Small Group	One-to-One	Seat work	Related to Subject Being Taught	Not Related to Subject Being Taught	Test	Interaction Instruction	Lecture	Teaching Aids	Total Group	Small Group	One-to-One	Organizational	Discipline	Monitoring	Non-Interaction Activity	COMMENTS
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	2 80
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	3 80
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	4 80

			STUDENTS								TEACHER										
				GROUPS WITH TEACHER				OTHER ACTIVITIES			INSTRUCTION			GROUPS			CLASSROOM MANAGEMENT				
TIME	GROUPS	# in Group	Not Academically Engaged	Total Group	Small Group	One-to-One	Seat work	Related to Subject Being Taught	Not Related to Subject Being Taught	Test	Interaction Instruction	Lecture	Teaching Aids	Total Group	Small Group	One-to-One	Organizational	Discipline	Monitoring	Non-Interaction Activity	COMMENTS
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					5
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	80
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					6
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	80
	A																				
	B																				
	C																				
	D																				
	E																				
	F																				
TOTAL																					7
		4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	80

CLASSROOM SKETCH (3)

(32) _____3. Classroom supplies and instructional materials are readily available to students (e.g., paper, pencils, workbooks, texts, etc.)

(1) Yes

(2) No

29

(80) 7

30

APPENDIX C

TEACHER SURVEY

In order that the reader can see which items are associated with each scale of the teacher survey, scale name abbreviations are inserted next to each item on the attached survey form. Lack of space made abbreviations necessary. The following list gives the full scale name corresponding to each abbreviation.

PRINPERS - Principal as a personnel manager

PRINLEAD - Principal as an academic leader

STUDEXPX - Teachers' expectations for students

DISTCURR - Usefulness of the district curriculum

EFFECTIVE - Effectiveness of building's instructional program

BLDGCLIM - Building climate

STANDARDS - Clarity of definition and consistency of building's standards for instruction and conduct

COORD - Coordination among building's programs

N.I. - Not included. Some items were excluded after initial analyses showed them to be poor measures. In some cases, items were poor because there was insufficient response variability. In other cases, i.e., items "3-5" and "6-8," there were two irreconcilable response patterns: one referring to direct, set-aside time-of-day instruction and the other to subject matter instruction as interwoven throughout the school day. Finally, some items were excluded because they correlated poorly with other items designed to comprise a given scale.

APPENDIX C

INSTRUCTIONAL STAFF SURVEY

I. In the blank to the left, please enter the number of the most correct answer.

N.I.1. Do you use ability groups/individualized instruction while teaching reading and/or math in your classroom?
1. Yes, nearly always
2. Yes, occasionally
3. No

N.I.2. Are your students given special instruction designed to improve their "test taking" skills (e.g., practice with standardized question and answer formats)?
1. Yes, these skills are taught thoroughly
2. Yes, these skills are taught somewhat
3. No, these skills are not taught

N.I.3-5 On the average, how many minutes of reading instruction per day do you provide to each student? (Please leave blank if not applicable.)

N.I.6-8 On the average, how many minutes of math instruction per day do you provide to each student? (Please leave blank if not applicable.)

II. This portion of the questionnaire is designed to obtain your opinion concerning school related issues. Please read each statement and record your response using the following scale.

1 = strongly agree
2 = agree
3 = no clear feeling
4 = disagree
5 = strongly disagree

PRINPERS 9. The principal finds time to listen to staff concerns.

PRINPERS 10. The principal routinely initiates procedures to remedy problems in the school.

PRINPERS 11. The principal is friendly and approachable.

PRINPERS 12. The principal often fails to explain his/her actions.

PRINPERS 13. The principal tries hard to create a pleasant atmosphere for staff.

PRINPERS 14. The principal seldom consults with staff before decisions.

PRINLEAD 15. The principal tries to make sure that all staff members are working up to capacity.

PRINLEAD 16. The principal maintains definite standards of staff performance.

PRINLEAD 17. The principal makes sure that all staff members know what is expected of them.

PRINLEAD 18. The principal has little influence over the staff.

PRINLEAD 19. The principal consistently provides leadership for the school's instructional program.

STUDEXPX 20. Most of my students will show at least one year's growth in academics this year.

STUDEXPX 21. Many of my students will have great difficulty with academics in Junior High School.

STUDEXPX 22. Many of my students probably will leave school before high school graduation.

STUDEXPX 23. Nearly all of my students will be at or above grade level by the end of this year.

N.I. 24. Districtwide instructional objectives stifle student learning.

DISTCURR 25. I find the Districtwide curriculum useful in meeting the needs of my students.

DISTCURR 26. When possible, Districtwide curriculum guides should be followed.

DISTCURR 27. The implementation of Districtwide instructional objectives increases student achievement.

DISTCURR 28. Districtwide curriculum materials are useful in my classroom.

BLDGCLIM 29. Working conditions in this building make it hard to do a good job.

BLDGCLIM 30. I like my job.

BLDGCLIM 31. I like working in this building.

N.I. 32. I have sufficient supplies and materials to teach as I want.

N.I. 33. This school needs more copies of the basal texts adopted by the District.

BLDGCLIM 34. I do not feel like an important part of this school.

BLDGCLIM 35. At this building considerable discord exists among staff members.

BLDGCLIM 36. Staff members at this building are very supportive.

BLDGCLIM 37. Staff members at this building tend to be unhappy.

N.I. 38. Students fight a lot at this school.

N.I. 39. A good working relationship exists between classified staff (secretaries, aides, etc.) and instructional staff in this building.

N.I. 40. The amount of time spent directly teaching math and reading at this school should be increased.

N.I. 41. Presently, there is too little emphasis placed on improving basic skills.

N.I. 42. Presently, there is too little emphasis placed on improving the self concept of students.

III. The list below refers to instructional, curricular, and administrative qualities. In the space provided on the left hand side of the page, indicate your personal opinion about how well these qualities describe your school as a whole by entering the number from the following scale.

1...If it is highly characteristic of your school
2...If it is moderately characteristic of your school
3...If it is not very characteristic of your school
4...If it is not at all characteristic of your school

This building has:

EFFECTIVE 43. An effective school-wide program in reading instruction.

EFFECTIVE 44. An effective school-wide program in math instruction.

EFFECTIVE 45. An effective school-wide program in language arts instruction.

EFFECTIVE 46. An effective school-wide program in social studies.

EFFECTIVE 47. An effective school-wide program in writing.

N.I. 48. Effective communication between supplementary program staff (Title I, Bilingual, Title VI, Special Education, etc.) and classroom instructors.

N.I. 49. Effective mainstreaming of students enrolled in supplementary programs.

STANDARDS 50. Clearly understood (by both staff and students) school-wide policies on discipline, safety, and attendance.

STANDARDS 51. An effective school-wide record keeping system to facilitate teacher awareness of student progress.

STANDARDS 52. Consistently applied policies on discipline and attendance.

STANDARDS 53. California Achievement Test (CAT) results readily available which guide instruction.

STANDARDS 54. Diagnostic test results available which guide instruction.

STANDARDS 55. Ongoing assessment of pupil achievement in basic skills.

COORD 56. Effective within grade instructional coordination (teacher meetings, large group activities, etc.).

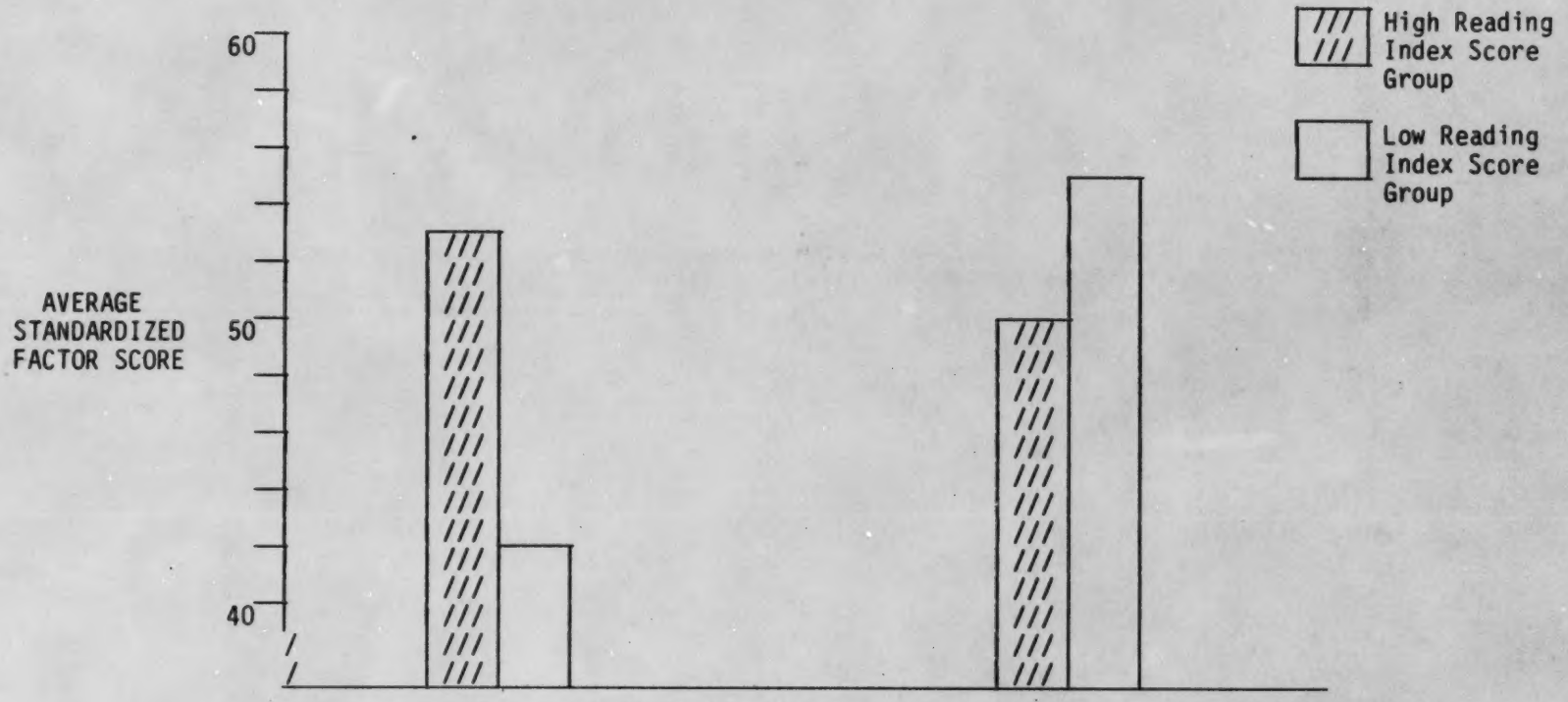
COORD 57. Effective school-wide instructional coordination (grade leader's meetings, curricular conferences, etc.).

____ 58-60. Security Code. (For Office Use)

APPENDIX D

FIGURE 1

AVERAGE DIFFERENCES BETWEEN HIGH AND LOW READING INDEX SCORE GROUPS
ON SCHOOL CHARACTERISTIC FACTORS
(GRADES 2 AND 3)



DIRECT INSTRUCTION FACTOR

Average percent of teacher time spent in:

(1) Interactive Instruction
(2) Monitoring

Average percent of student time spent in:

(3) Small or Total Group Setting

TEACHER CONTROL FACTOR

Average percent of teacher time spent in:

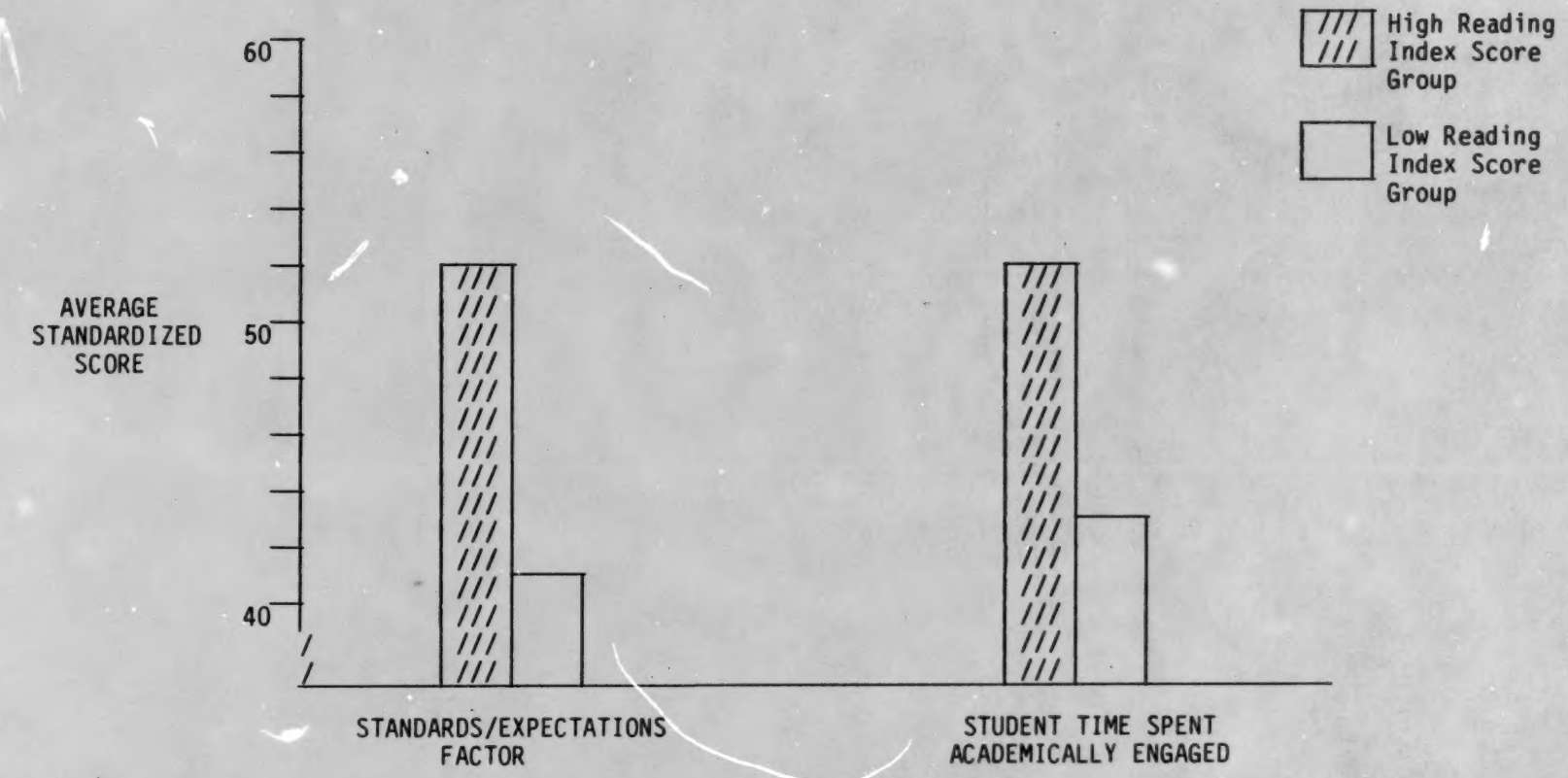
(1) Organization
(2) Lecture

Average percent of student time spent in:

(3) One-to-One Setting

FIGURE 2A

AVERAGE DIFFERENCES BETWEEN HIGH AND LOW READING INDEX SCORE GROUPS
ON SCHOOL CHARACTERISTIC VARIABLES
(GRADES 4 THROUGH 6)

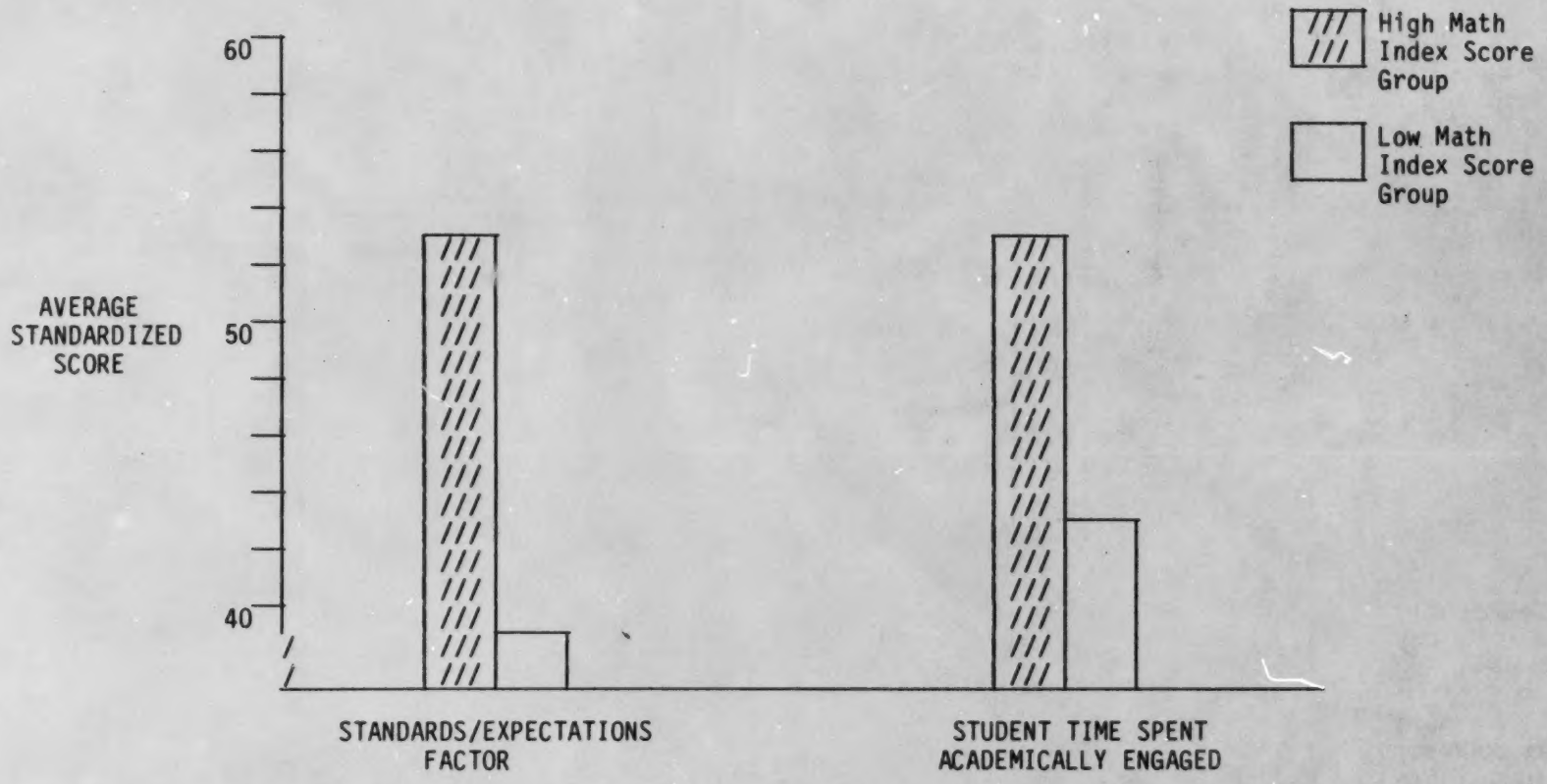


(1) Clarity and consistency of building's standards

(2) Teacher's expectations for students

FIGURE 2B

AVERAGE DIFFERENCES BETWEEN HIGH AND LOW MATH INDEX SCORE GROUPS
ON SCHOOL CHARACTERISTIC VARIABLES
(GRADES 4 THROUGH 6)

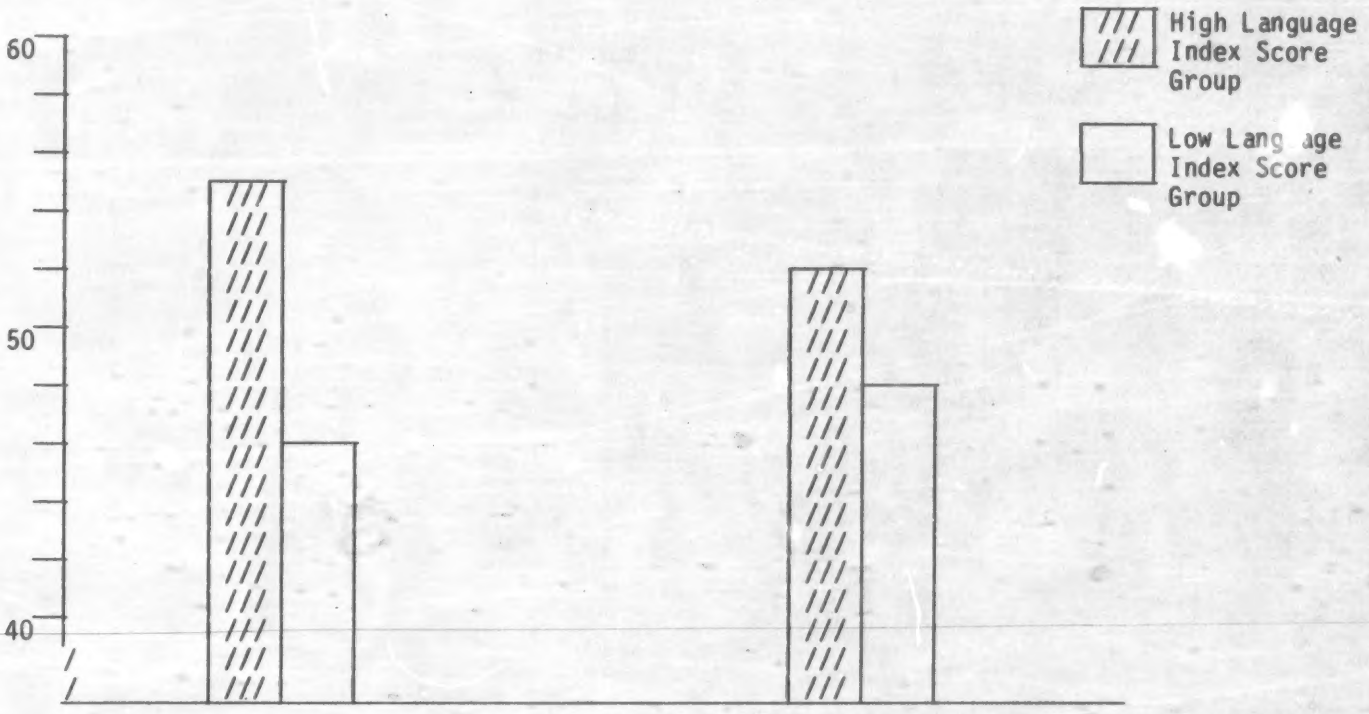


(1) Clarity and consistency of building's standards

(2) Teacher's expectations for students

FIGURE 2C

AVERAGE DIFFERENCES BETWEEN HIGH AND LOW LANGUAGE INDEX SCORE GROUPS
ON SCHOOL CHARACTERISTIC VARIABLES
(GRADES 4 THROUGH 6)

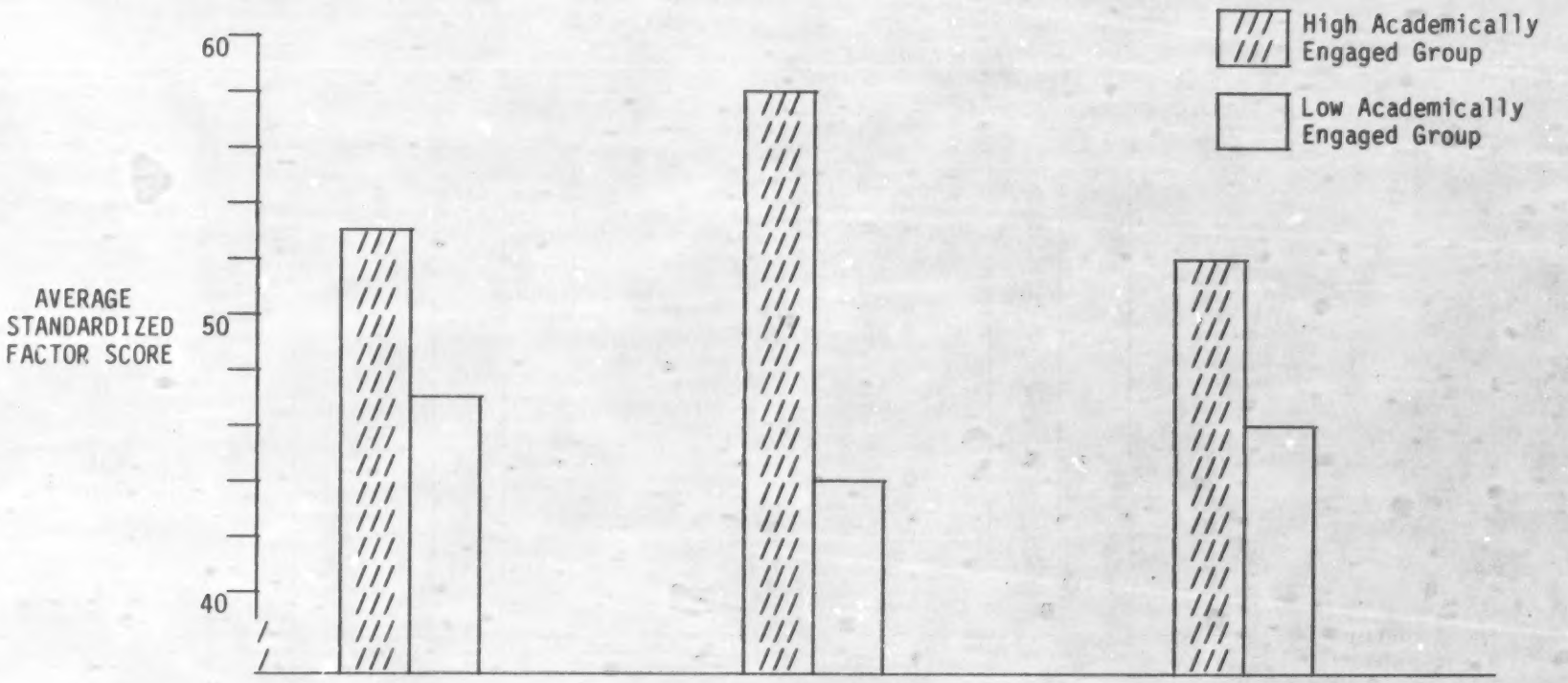


(1) Clarity and consistency of building's standards

(2) Teacher's expectations for students

FIGURE 3

AVERAGE DIFFERENCES BETWEEN HIGH AND LOW 'ACADEMICALLY ENGAGED' GROUPS
ON SCHOOL CHARACTERISTIC FACTORS
(GRADES 4 THROUGH 6)



INSTRUCTION VERSUS MANAGEMENT FACTOR

Average percent of teacher time spent in:

(1) Interactive Instruction
(2) Monitoring (negative)
(3) Organization (negative)

SEATWORK VERSUS TOTAL GROUP PARTICIPATION FACTOR

Average percent of student time spent in:

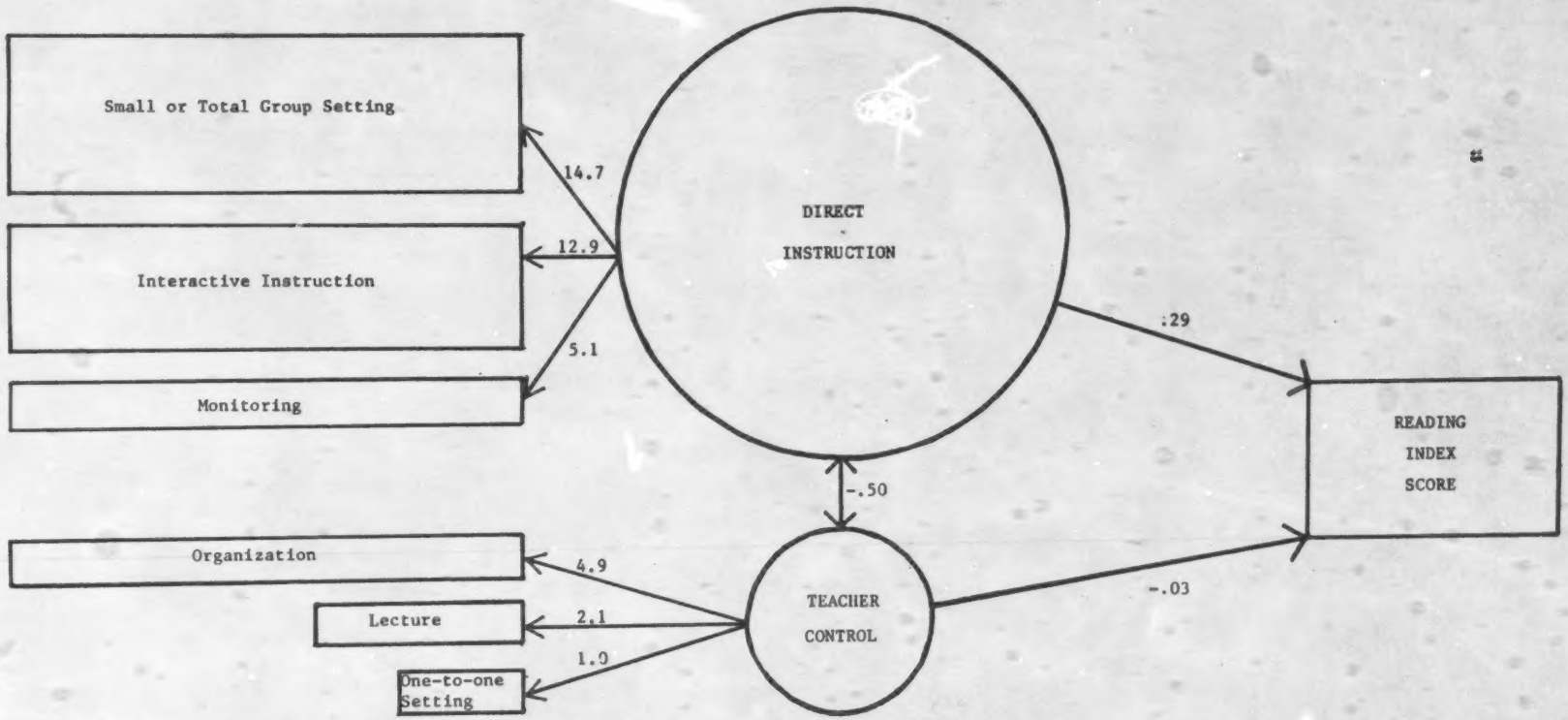
(1) Seatwork
(2) Total Group Setting (negative)

STANDARDS/ EXPECTATIONS FACTOR

(1) Clarity and consistency of building's standards
(2) Teachers' expectations for students

FIGURE 4

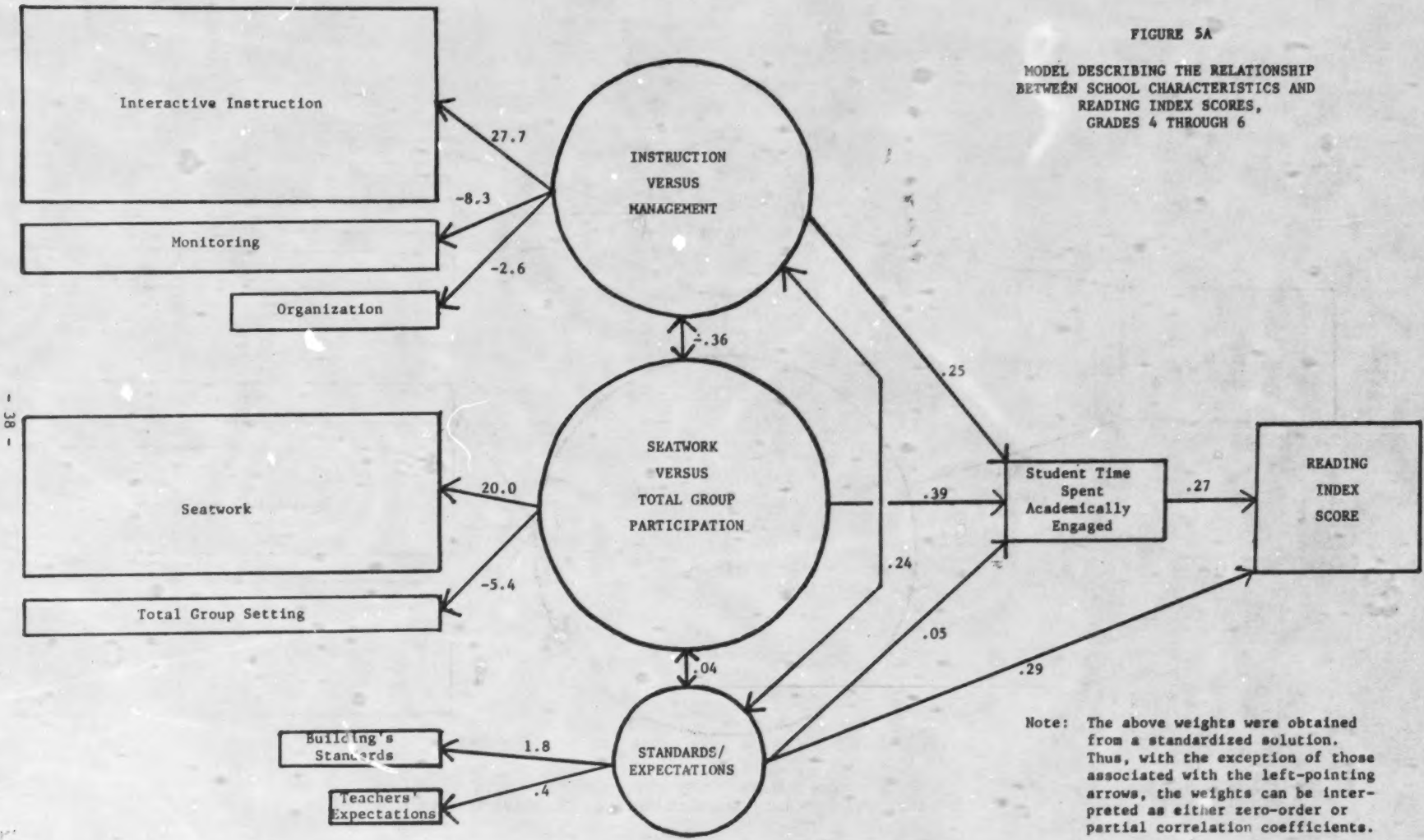
MODEL DESCRIBING THE RELATIONSHIP BETWEEN SCHOOL CHARACTERISTICS AND READING INDEX SCORES, GRADES 2 AND 3



Note: The above weights were obtained from a standardized solution. Thus, with the exception of those associated with the left pointing arrows, the weights can be interpreted as either zero-order or partial correlation coefficients.

FIGURE 5A

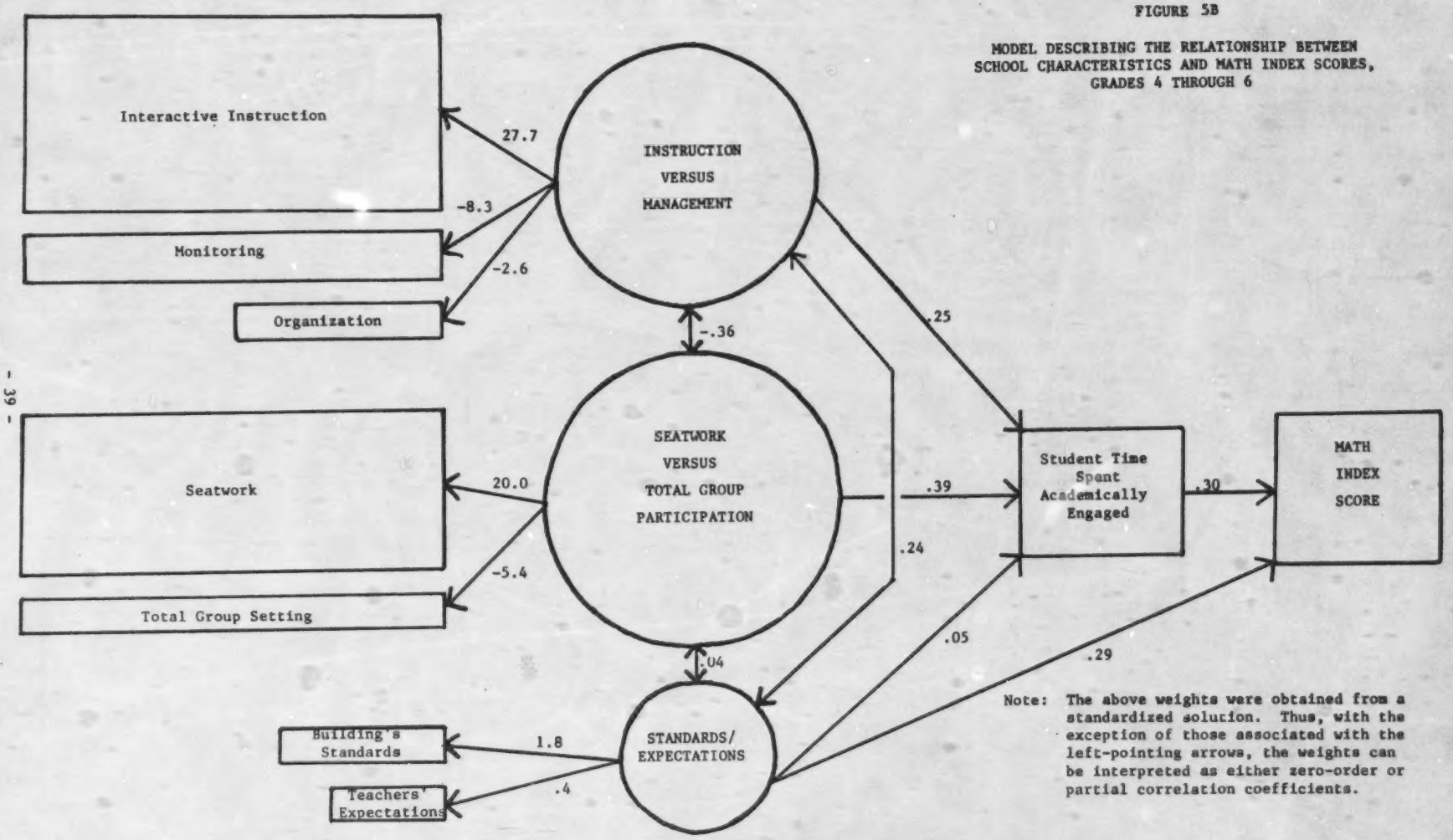
MODEL DESCRIBING THE RELATIONSHIP BETWEEN SCHOOL CHARACTERISTICS AND READING INDEX SCORES, GRADES 4 THROUGH 6



Note: The above weights were obtained from a standardized solution. Thus, with the exception of those associated with the left-pointing arrows, the weights can be interpreted as either zero-order or partial correlation coefficients.

FIGURE 5B

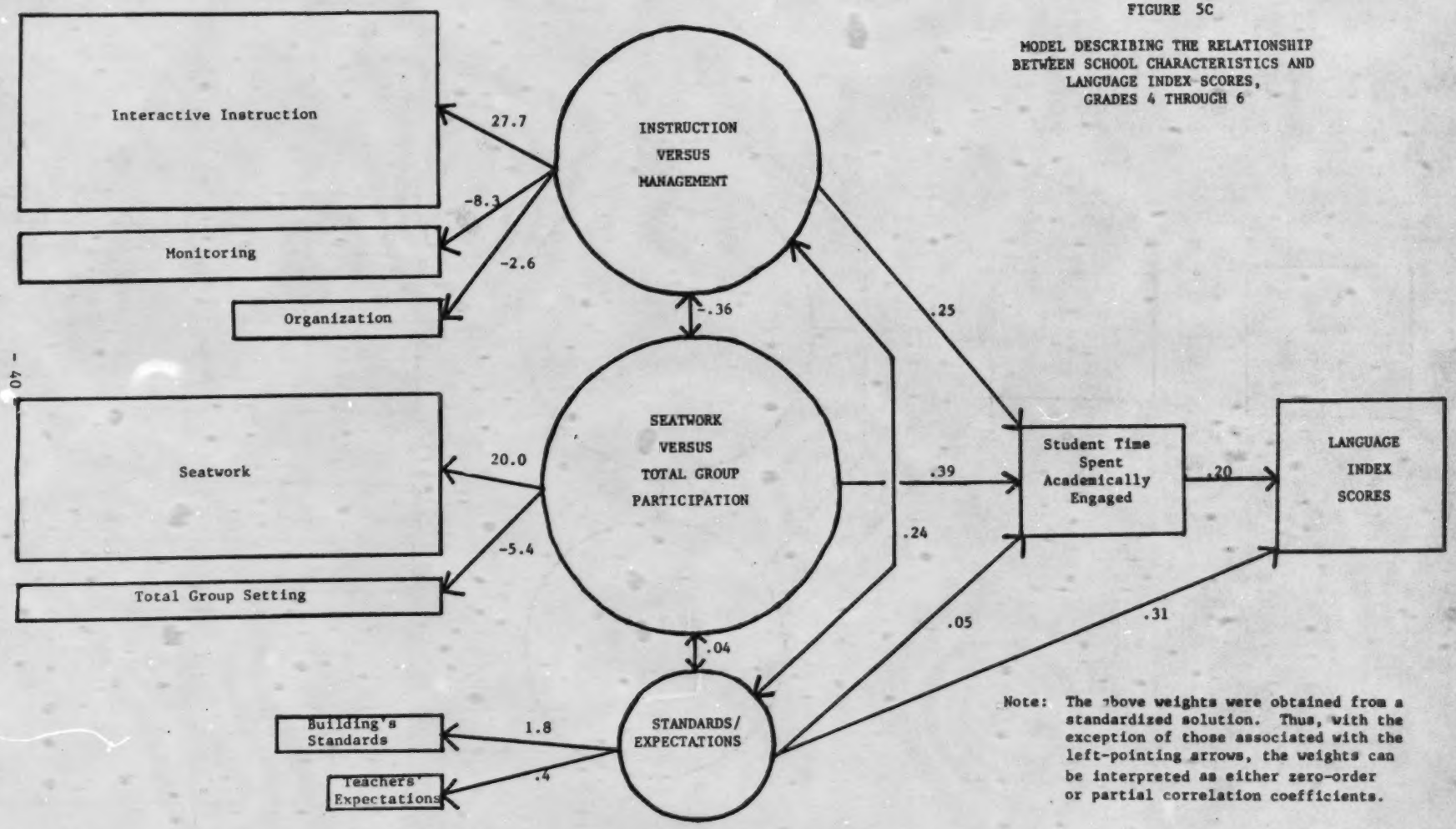
MODEL DESCRIBING THE RELATIONSHIP BETWEEN SCHOOL CHARACTERISTICS AND MATH INDEX SCORES, GRADES 4 THROUGH 6



Note: The above weights were obtained from a standardized solution. Thus, with the exception of those associated with the left-pointing arrows, the weights can be interpreted as either zero-order or partial correlation coefficients.

FIGURE 5C

MODEL DESCRIBING THE RELATIONSHIP BETWEEN SCHOOL CHARACTERISTICS AND LANGUAGE INDEX SCORES, GRADES 4 THROUGH 6



Note: The above weights were obtained from a standardized solution. Thus, with the exception of those associated with the left-pointing arrows, the weights can be interpreted as either zero-order or partial correlation coefficients.

TABLE 1

READING INDEX, FACTOR, AND SCHOOL CHARACTERISTIC VARIABLE SCORES BY CASE (GRADE WITHIN SCHOOL)
(GRADES 2 AND 3)

Case Number	Reading Index Score	Direct Instruction Factor Score*	Percent Teacher Time in Interactive Instruction	Percent Teacher Time Monitoring	Percent Student Time in Small or Total Group Setting	Classroom Control Factor Score*	Percent Teacher Time Organizing	Percent Teacher Time Lecturing	Percent Student Time in One-on-one Setting	Percent Student Time Academically Engaged	Percent Student Time in Seatwork	Percent Student Time Being Tested	Teachers' Expectations for Students
1	2.80	70.8	86.9	8.1	72.4	35.3	.8	0.0	.4	93.5	20.7	0.0	14.0
2	2.49	60.0	76.2	8.2	54.5	47.3	8.7	0.0	.4	80.1	23.2	0.0	14.9
3	1.83	52.9	56.8	22.2	48.8	57.0	14.5	1.5	0.0	71.7	17.2	5.6	17.3
4	1.75	43.6	48.1	27.0	31.5	46.6	6.8	3.1	1.0	79.1	44.5	1.7	14.2
5	1.12	48.3	59.2	12.5	38.4	53.0	11.3	2.2	1.2	72.8	24.0	0.0	13.4
6	.78	53.8	71.2	1.7	45.5	57.9	10.2	12.9	.3	76.8	29.1	0.0	17.5
7	.69	42.2	48.4	19.3	30.2	63.3	16.5	6.7	0.0	58.5	19.8	0.0	14.3
8	.66	59.5	73.2	8.4	55.9	46.9	8.4	0.0	.4	79.2	17.7	0.0	12.6
9	.59	35.8	42.3	23.2	18.1	61.3	17.8	0.0	.6	63.4	35.7	4.3	13.8
10	.57	49.0	52.0	16.9	45.2	51.3	11.3	0.0	.8	73.1	21.8	0.0	12.6
11	.56	47.6	65.4	26.6	26.3	42.1	5.3	0.0	0.0	71.4	42.5	0.0	11.9
12	.56	52.4	61.9	26.2	41.6	49.2	10.1	0.0	0.0	71.0	21.9	5.6	17.3
13	.53	46.4	61.3	10.8	32.4	52.1	11.9	0.0	0.0	58.2	20.1	0.0	12.8
14	.49	51.1	49.5	29.5	48.2	41.5	4.5	1.0	0.0	77.1	28.7	0.0	13.8
15	.44	47.4	63.1	20.3	30.0	47.1	8.1	.5	1.5	73.7	37.9	1.6	15.5
16	.37	33.7	30.5	46.0	15.2	55.7	14.3	0.0	0.0	61.3	25.0	10.0	14.3
17	.29	43.5	54.4	30.8	24.3	45.4	7.3	0.0	1.1	73.7	37.3	0.0	14.4
18	.24	50.4	80.9	.7	28.8	53.0	11.4	0.0	5.2	78.8	43.1	0.0	13.4
19	.24	76.8	89.6	2.1	87.2	40.5	4.2	0.0	.8	89.5	1.4	0.0	14.0
20	.13	56.3	68.6	22.9	46.8	36.6	1.6	0.0	.7	87.1	39.5	0.0	12.7
21	-.10	64.7	77.1	10.4	64.8	42.5	5.5	0.0	.6	75.7	9.9	0.0	12.7
22	-.15	61.1	79.6	6.9	54.7	46.4	8.1	0.0	.3	85.9	21.3	0.0	14.3
23	-.17	47.9	61.3	19.0	33.5	57.0	15.0	0.0	.6	68.6	23.3	0.0	14.4
24	-.20	53.5	57.5	18.0	51.1	54.3	13.3	0.0	.3	82.5	13.0	10.5	16.0
25	-.36	39.0	40.1	50.6	18.6	39.2	3.4	0.0	.3	85.6	17.7	48.9	14.4
26	-.65	50.1	70.7	16.4	31.7	47.8	8.8	0.0	1.6	86.5	49.6	0.0	14.9
27	-.71	51.9	61.5	24.6	41.4	49.6	10.1	0.0	.8	77.4	32.6	0.0	13.0
28	-.74	44.1	55.2	15.0	30.6	58.2	14.9	1.4	1.8	74.6	34.5	0.0	13.4
29	-.76	60.7	84.3	4.4	50.5	45.3	7.4	0.0	.5	73.1	15.7	5.3	16.0
30	-.88	56.2	69.3	5.3	51.9	49.0	7.4	5.6	.3	80.5	17.2	0.0	14.3
31	-.89	45.1	65.2	8.0	26.7	51.9	10.1	3.7	.6	73.2	45.4	0.0	14.4
32	-1.21	44.4	62.5	22.3	22.4	43.3	5.6	.6	1.4	69.1	43.9	0.0	14.2
33	-1.31	27.8	34.0	15.4	7.9	90.8	28.3	16.7	9.0	54.5	37.6	0.0	17.5
34	-1.58	36.7	36.8	54.9	14.2	34.0	0.0	0.0	0.0	76.7	39.7	10.5	11.9
35	-1.60	52.6	58.1	25.9	45.6	54.8	13.6	0.0	.3	75.3	27.2	0.0	13.0
36	-1.80	42.9	54.8	16.3	27.6	52.9	11.3	2.1	1.5	75.1	45.1	0.0	12.8

* To facilitate comparison between factor scores, which are in different units, these scores were standardized to have an average of 50 and a standard deviation of 10.

TABLE 2

MATRIX OF CORRELATIONS AMONG INDEX SCORES, VARIABLES, AND FACTORS
(GRADES 2 AND 3)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
(1) Reading Index Score	1.0																									
(2) Direct Instruction Factor Score	.34	1.0																								
(3) Percent Teacher Time in Interactive Instruction	.23	.89	1.0																							
(4) Percent Teacher Time Monitoring	-.18	-.59	-.76	1.0																						
(5) Percent Student Time in Small or Total Group Setting	.37	.96	.76	-.56	1.0																					
(6) Teacher Control Factor Score	-.16	-.50	-.40	-.19	-.39	1.0																				
(7) Percent Teacher Time Organizing	-.14	-.50	-.41	-.15	-.39	.97	1.0																			
(8) Percent Teacher Time Lecturing	-.12	-.32	-.23	-.23	-.23	.69	.52	1.0																		
(9) Percent Student Time in One-on-One Setting	-.26	-.34	-.13	-.21	-.35	.62	.53	.54	1.0																	
(10) Percent Student Time Academically Engaged	.15	.67	.57	-.16	.61	-.68	-.70	-.37	-.26	1.0																
(11) Percent Student Time in Seatwork	-.27	-.56	-.28	.22	-.67	.08	.04	.12	.05	-.12	1.0															
(12) Percent Student Time Being Tested	-.09	-.27	-.38	.58	-.26	-.18	-.17	-.14	-.14	.14	-.20	1.0														
(13) Teachers' Expectations for Students	.16	-.03	-.01	-.17	.00	.46	.39	.51	.24	-.14	-.15	.11	1.0													
(14) Math Index Score	.61	.16	.07	-.05	.20	-.11	-.09	-.09	-.23	.03	-.07	-.22	-.01	1.0												
(15) Language Index Score	.69	.22	.18	-.12	.22	-.19	-.19	-.09	-.23	.04	-.06	-.16	-.02	.66	1.0											
(16) Percent Student Time in Other Related Activities	.02	-.22	-.20	.14	-.21	.13	.20	-.08	-.19	-.31	-.13	-.04	.02	-.08	-.05	1.0										
(17) Percent Student Time in Other Nonrelated Activities	-.25	-.14	-.18	.15	-.12	-.06	-.04	-.09	-.11	.04	.00	-.05	-.33	.05	-.32	.12	1.0									
(18) Percent Teacher Time in Discipline	.20	-.18	-.16	-.07	-.13	.17	.22	-.06	-.07	-.48	-.16	-.07	-.22	.02	.20	.22	-.09	1.0								
(19) Percent Teacher Time in Noninteractive Activity	-.12	-.24	-.30	.05	-.15	.00	-.00	.01	-.01	.06	.26	-.06	-.23	.07	-.09	-.09	.35	-.18	1.0							
(20) Principal as Academic Leader	.12	-.26	-.20	.22	-.30	.11	.08	.15	.09	-.13	.21	.08	.17	.08	-.07	.15	-.01	.15	-.32	1.0						
(21) Principal as Personnel Manager	-.01	-.13	-.10	.11	-.15	.05	-.02	.23	.11	-.01	.20	-.07	-.02	-.19	-.04	.06	.07	.11	-.26	.56	1.0					
(22) Building Climate	.11	-.18	-.17	.24	-.20	.05	.01	.16	.04	-.07	.17	.20	.27	-.17	.04	-.13	-.25	.11	-.35	.47	.69	1.0				
(23) Usefulness of District Curriculum	-.03	.19	.15	.04	.16	-.23	-.15	-.37	-.32	.23	-.26	.19	-.27	.03	-.09	.17	.22	.09	-.17	.27	.14	.02	1.0			
(24) Coordination Among Building's Programs	-.03	-.09	.05	-.13	-.13	.12	.00	.21	.20	.02	.10	.03	.22	-.23	-.08	.32	-.10	.11	-.15	.56	.60	.24	.21	1.0		
(25) Effectiveness of Building's Instructional Program	-.02	-.08	.01	.09	-.15	.06	-.01	.26	.09	.05	.03	.32	.49	-.11	-.11	.08	-.23	-.19	-.39	.68	.36	.46	.36	.57	1.0	
(26) Clarity and Consistency of Building's Standards	.14	.00	.03	.07	-.03	.12	.08	.19	.06	-.01	-.03	.12	.58	.06	-.07	.01	-.19	-.17	-.45	.62	.34	.46	.22	.45	.82	1.0
VECTOR OF STANDARD DEVIATIONS	1.07	10.0	14.6	12.8	17.0	10.0	5.4	3.6	1.7	8.7	11.9	8.5	1.52	1.5	1.5	2.7	2.6	3.0	4.3	1.32	2.96	3.01	1.74	0.72	1.58	1.67

TABLE 3

INDEX, FACTOR, AND SCHOOL CHARACTERISTIC VARIABLE SCORES BY CASE (GRADE WITHIN SCHOOL)
(GRADES 4 THROUGH 6)

Case Number	Reading Index Score	Math Index Score	Language Index Score	Percent Student Time Academically Engaged	Instruction Versus Management Factor Score*	Percent Teacher Time in Interactive Instruction	Percent Teacher Time Monitoring	Percent Teacher Time Organizing	Seatwork Versus Total Group Participation Factor Score*	Percent Student Time in Seatwork	Percent Student Time in Total Group Setting	Standards/ Expectations Factor Score*
1	1.94	3.37	3.47	93.2	57.4	74.5	20.4	3.5	66.4	54.9	36.6	56.6
2	1.74	2.68	.94	70.6	41.3	42.7	31.5	16.3	48.0	26.6	38.4	64.4
3	1.66	1.78	1.76	67.8	43.7	45.6	23.5	14.0	45.5	20.4	29.8	45.0
4	1.60	3.34	1.50	76.1	52.7	63.4	16.0	12.4	42.7	21.3	49.2	45.0
5	1.38	-.86	.63	67.3	47.6	52.3	17.8	10.4	43.6	18.5	33.5	58.3
6	1.15	1.86	1.20	83.2	55.2	68.4	14.0	12.5	55.4	37.8	37.1	42.8
7	1.04	.82	.82	64.4	49.8	55.7	10.8	15.5	41.6	18.1	44.1	43.8
8	1.03	-1.12	.99	74.5	63.1	81.5	.8	5.0	57.1	36.3	21.9	48.2
9	.99	.81	-.20	75.4	53.9	64.7	2.8	19.8	33.1	10.6	64.7	37.1
10	.82	1.00	1.46	73.1	33.9	30.5	45.1	18.7	56.3	36.2	26.0	57.7
11	.67	.77	-.49	75.6	56.7	59.6	8.7	5.3	53.2	34.6	37.7	63.1
12	.53	-.04	-.27	89.5	54.9	68.2	16.0	9.9	62.5	47.3	30.9	56.6
13	.47	-.27	-1.37	83.8	52.1	61.0	15.5	2.9	44.1	19.3	33.9	48.2
14	.41	2.15	1.64	74.5	54.6	64.9	6.8	12.5	43.8	21.4	43.4	63.1
15	.35	.78	-.18	79.6	55.0	68.9	18.3	7.9	66.3	48.6	14.2	55.4
16	.26	-.05	.36	60.7	28.8	21.5	52.8	19.0	51.7	25.7	13.7	57.7
17	.18	.16	-.65	82.7	61.8	80.6	6.8	7.5	55.5	33.2	19.3	52.0
18	.10	.31	-.04	80.1	65.2	87.4	4.2	4.8	62.2	45.9	27.9	55.4
19	.07	.79	.46	92.3	67.1	91.4	5.2	1.0	74.1	60.2	11.8	56.6
20	.06	-2.29	-.37	68.8	54.2	64.9	10.0	12.1	43.8	18.1	31.6	48.2
21	.03	.53	.16	90.8	46.0	54.4	38.9	2.3	47.8	30.9	55.2	42.8
22	.02	1.37	1.07	74.4	45.9	53.1	34.0	7.9	51.5	30.7	33.1	64.4
23	0.0	1.78	-.38	77.7	55.6	67.6	8.4	12.5	43.2	19.6	40.1	58.3
24	-.09	.85	-.05	76.5	49.1	56.0	19.6	8.6	52.9	32.7	32.2	63.1
25	-.10	-.02	-.38	76.5	54.6	66.3	12.9	7.6	56.6	36.1	23.8	55.4
26	-.13	-.65	-.90	88.5	44.0	50.0	37.1	10.8	57.5	42.3	41.7	49.4
27	-.20	.13	-.58	69.0	44.2	49.3	32.9	10.4	47.6	25.0	34.7	43.1
28	-.22	-1.32	-.99	74.5	48.2	50.3	6.8	9.3	52.0	32.7	38.1	51.3
29	-.30	-.99	-.48	75.3	58.5	71.2	0.0	7.2	46.5	25.6	43.5	59.2
30	-.32	-.78	.80	64.2	50.4	59.4	20.7	9.7	42.9	19.8	42.4	43.1
31	-.38	-1.51	1.10	74.5	57.4	72.1	11.0	8.5	43.8	22.9	48.9	58.3
32	-.41	-.45	1.35	71.6	57.3	70.6	6.6	9.1	37.2	12.1	47.0	64.4
33	-.50	.35	.55	81.4	55.9	66.9	5.8	5.9	37.6	14.9	43.5	52.0
34	-.52	.65	-1.56	68.2	38.0	35.1	32.0	11.2	60.2	38.5	15.9	43.8
35	-.52	-.42	-.55	56.3	42.0	43.7	28.9	16.2	42.0	16.2	34.7	45.0
36	.53	-.24	.46	74.9	36.5	32.0	32.7	12.7	42.9	21.3	48.4	37.1
37	-.58	-1.27	-.20	76.0	57.9	69.6	.4	3.1	35.1	8.5	46.2	59.2
38	-.58	-.70	-.58	73.9	33.6	30.4	47.0	19.5	55.8	35.2	24.9	51.3
39	-.59	.04	-1.29	65.5	44.1	44.9	18.0	13.8	51.4	29.8	30.8	43.8
40	-.63	-.04	-.19	74.4	40.7	43.4	39.6	9.4	61.4	41.3	15.5	43.1
41	-.64	-1.78	-.47	75.7	28.3	19.4	48.0	24.7	71.4	57.4	17.1	21.7
42	-.87	-1.44	-.73	83.2	27.9	16.3	45.6	8.7	50.0	26.5	26.7	21.7
43	-1.11	-1.60	-.64	50.6	58.4	73.4	8.7	6.0	43.2	17.5	32.5	49.4
44	-1.12	1.23	1.19	84.5	49.2	57.4	20.3	18.2	42.7	23.5	57.1	51.3
45	-1.51	.05	-.39	64.6	53.2	63.3	13.3	6.7	60.0	41.3	23.3	49.4
46	-1.66	-1.48	-1.38	57.4	53.5	63.6	8.1	20.0	41.6	14.5	30.8	37.1
47	-1.81	-.35	-.54	66.3	70.7	98.0	0.0	0.0	26.4	0.0	65.0	36.3

* To facilitate comparisons among factor scores and teacher survey variable scores, which are in different units, these scores were standardized to have an average of 50 and a standard deviation of 10.

TABLE 3 - Continued

INDEX, FACTOR, AND SCHOOL CHARACTERISTIC VARIABLE SCORES BY CASE (GRADE WITHIN SCHOOL)
(GRADES 4 THROUGH 6)

Case Number	Clarity and Consistency of Building's Standards*	Teachers' Expectations for Students*	Principal as Academic Leader*	Principal as Personnel Manager	Building Climate	Usefulness of District Curriculum	Coordination Among Building's Programs*	Effectiveness of Building's Instructional Program*	Percent Student Time in Small Group or One-to-One Setting	Percent Teacher Time in Lecturing	Percent Teacher Time in Discipline	Percent Student Time Being Tested
1	57.6	48.8	52.1	52.7	56.3	55.7	51.3	57.3	1.5	0.0	0.0	0.0
2	61.6	70.2	48.9	29.2	54.7	47.0	30.4	56.0	.5	5.0	.8	0.0
3	47.2	37.5	38.9	42.7	54.2	50.6	47.5	29.3	2.5	6.5	4.8	9.2
4	47.2	37.5	38.9	42.7	54.2	50.6	47.5	29.3	5.6	0.0	3.2	0.0
5	60.7	43.7	64.2	62.9	58.3	52.8	58.5	42.3	2.7	3.7	12.0	7.9
6	40.7	55.7	45.0	51.7	52.9	43.0	35.2	32.1	1.5	3.8	.9	4.6
7	42.8	51.4	46.4	44.8	44.7	49.6	48.9	52.1	1.4	9.7	1.4	0.0
8	49.2	44.9	45.7	53.3	47.0	43.6	45.4	44.6	10.7	0.0	3.1	0.0
9	37.6	41.0	38.0	33.2	36.4	49.9	41.2	44.8	.1	2.5	1.8	6.
10	58.5	50.6	73.3	63.6	62.5	70.0	64.3	63.8	0.0	0.0	0.0	10.7
11	63.4	55.3	66.1	58.1	57.2	59.2	64.8	60.2	1.6	2.3	5.7	0.0
12	57.6	48.8	52.1	52.7	56.3	55.7	51.3	57.3	4.1	0.0	2.4	6.3
13	49.2	44.9	45.7	53.3	47.0	43.6	45.4	44.6	4.5	2.1	1.5	24.7
14	63.4	55.3	66.1	58.1	57.2	59.2	64.8	60.2	8.3	3.9	4.0	0.0
15	53.4	61.8	38.4	45.7	42.3	53.0	63.8	54.8	12.7	.8	.8	3.2
16	58.5	50.6	73.3	63.6	62.5	70.0	64.3	63.8	5.1	0.0	.8	13.8
17	52.0	50.8	54.6	57.0	42.3	69.8	56.1	60.7	15.1	.6	0.0	0.0
18	53.4	61.8	38.4	45.7	42.3	53.0	63.8	54.8	4.0	.7	0.0	0.0
19	57.6	48.8	52.1	52.7	56.3	55.7	51.3	57.3	19.9	0.0	2.4	0.0
20	49.2	44.9	45.7	53.3	47.0	43.6	45.4	44.6	13.8	0.0	5.1	0.0
21	40.7	55.7	45.0	51.7	52.9	43.0	35.2	32.1	3.5	3.4	.9	0.0
22	61.6	70.2	48.9	29.2	54.7	47.0	30.4	56.0	1.1	1.8	0.0	0.0
23	60.7	43.7	64.2	62.9	58.3	52.8	58.5	42.3	7.0	0.0	5.9	8.4
24	63.4	55.3	66.1	58.1	57.2	59.2	64.8	60.2	7.5	1.1	3.0	2.9
25	53.4	61.8	38.4	45.7	42.3	53.0	63.8	54.8	14.2	0.0	.4	3.7
26	52.6	35.1	50.7	59.3	55.6	53.6	46.0	53.6	.3	0.0	0.0	0.0
27	42.2	50.4	58.0	59.2	65.7	27.1	56.5	51.2	4.3	3.7	1.2	4.0
28	51.3	50.8	50.5	45.9	32.4	47.4	51.2	56.0	.8	13.3	0.0	0.0
29	55.5	71.4	49.9	58.2	56.8	31.5	55.0	59.2	4.7	12.9	1.0	0.0
30	42.2	50.4	58.0	59.2	65.7	27.1	56.5	51.2	1.3	3.5	2.4	0.0
31	60.7	43.7	64.2	62.9	58.3	52.8	58.5	42.3	1.6	1.5	1.2	0.0
32	61.6	70.2	48.9	29.2	54.7	47.0	30.4	56.0	.9	2.4	2.0	1.9
33	52.0	50.8	54.6	57.0	42.3	69.8	56.1	60.7	12.9	2.6	4.3	0.0
34	42.8	51.4	46.4	44.8	44.7	49.6	48.9	52.1	.8	6.3	1.3	6.3
35	47.2	37.5	38.9	42.7	54.2	50.6	47.5	29.3	.4	5.4	4.6	0.0
36	37.6	41.0	38.0	33.2	36.4	49.9	41.2	44.8	1.1	14.4	1.5	3.7
37	55.5	71.4	49.9	58.2	56.8	31.5	55.0	59.2	21.1	0.0	10.8	0.0
38	51.3	50.8	50.5	45.9	32.4	47.4	51.2	56.0	.7	0.0	2.2	11.4
39	42.8	51.4	46.4	44.8	44.7	49.6	48.9	52.1	2.0	10.5	1.7	0.0
40	42.2	50.4	58.0	59.2	65.7	27.1	56.5	51.2	6.6	.5	.9	5.0
41	20.8	39.7	35.3	46.2	41.7	48.6	34.3	30.8	0.0	0.0	7.9	0.0
42	20.8	39.7	35.3	46.2	41.7	48.6	34.3	30.8	0.0	1.5	1.5	22.4
43	52.6	35.1	50.7	59.3	55.6	53.6	46.0	53.6	0.0	0.0	6.0	0.0
44	51.3	50.8	50.5	45.9	32.4	47.4	51.2	56.0	.7	2.3	1.2	2.6
45	52.6	35.1	50.7	59.3	55.6	53.6	46.0	53.6	0.0	0.0	13.3	0.0
46	37.6	41.0	38.0	33.2	36.4	49.9	41.2	44.8	11.2	1.4	1.4	0.0
47	36.9	40.2	40.4	35.4	23.5	55.9	43.9	50.1	0.0	0.0	2.0	.6

* To facilitate comparisons among factor scores and teacher survey variable scores, which are in different units, these scores were standardized to have an average of 50 and a standard deviation of 10.

TABLE 4

MATRIX OF CORRELATIONS AMONG INDEX SCORES, VARIABLES, AND FACTORS
(GRADES 4 THROUGH 6)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
(1) Reading Index Score	1.0																										
(2) Math Index Score	.60	1.0																									
(3) Language Index Score	.58	.58	1.0																								
(4) Percent Student Time Academically Engaged	.29	.31	.22	1.0																							
(5) Instruction Versus Management Factor Score	.02	.07	.11	.17	1.0																						
(6) Percent Teacher Time in Interactive Instruction	.03	.10	.13	.20	.99	1.0																					
(7) Percent Teacher Time Monitoring	.00	.03	-.01	.00	-.91	-.87	1.0																				
(8) Percent Teacher Time Organizing	.06	.02	.00	-.34	-.64	-.64	.48	1.0																			
(9) Seatwork Versus Total Group Participation Factor Score	.16	.11	-.00	.42	-.16	-.12	.31	-.04	1.0																		
(10) Percent Student Time in Seatwork	.19	.17	.05	.51	-.11	-.07	.28	-.06	.99	1.0																	
(11) Percent Student Time in Total Group Setting	-.02	.13	.22	.05	.27	.26	-.32	-.07	-.77	-.64	1.0																
(12) Standards/Expectations Factor Score	.31	.31	.32	.12	.35	.35	-.29	-.27	.05	.06	-.02	1.0															
(13) Clarity and Consistency of Building's Standards	.31	.30	.32	.09	.35	.36	-.29	-.25	.05	.05	-.03	.98	1.0														
(14) Teachers' Expectations for Students	.14	.18	.15	.20	.15	.15	-.14	-.20	.05	.07	.00	.58	.43	1.0													
(15) Principal as Academic Leader	.13	.12	.21	-.03	-.04	-.03	.08	-.02	.03	.01	-.09	.60	.64	.14	1.0												
(16) Principal as Personnel Manager	.04	-.15	-.01	.11	.06	.06	-.01	-.22	.21	.19	-.24	.24	.30	-.15	.70	1.0											
(17) Building Climate	.33	.20	.31	-.04	-.07	-.05	.16	-.12	.16	.14	-.20	.42	.44	.15	.61	.57	1.0										
(18) Usefulness of District Curriculum	.13	.24	.13	.08	.03	.04	-.00	.08	.13	.12	-.15	.24	.31	-.21	.26	.08	-.17	1.0									
(19) Coordination Among Building's Programs	.07	.06	-.00	-.00	.18	.17	-.17	-.13	.16	.13	-.23	.44	.47	.09	.58	.65	.26	.27	1.0								
(20) Effectiveness of Building's Instructional Program	-.10	.06	.00	.06	.22	.22	-.18	-.19	.15	.14	-.14	.64	.61	.50	.54	.22	.09	.27	.49	1.0							
(21) Percent Student Time in Small Group or One-to-One Setting	-.01	-.09	-.08	.22	.43	.42	-.42	-.33	.11	.06	-.29	.25	.22	.26	.03	.22	.04	.04	.34	.24	1.0						
(22) Percent Teacher Time Lecturing	.03	-.02	-.08	-.19	-.19	-.24	-.06	.13	-.22	-.20	.24	-.11	-.15	.14	-.15	-.26	-.17	-.23	-.12	-.06	-.29	1.0					
(23) Percent Teacher Time in Discipline	-.12	-.22	-.07	-.30	.06	.03	-.19	-.03	-.13	-.17	-.03	.01	.07	-.25	.10	.29	.19	-.03	.05	-.17	.11	-.18	1.0				
(24) Percent Student Time Being Tested	.07	-.06	-.17	.10	-.47	-.47	.44	.09	.03	-.04	-.28	-.17	-.15	-.16	.09	.14	.02	.06	.03	-.16	-.15	-.11	-.08	1.0			
(25) Percent Student Time in Other Related Activities	-.04	-.10	-.07	.03	.10	.10	-.07	-.13	.07	.01	-.29	.14	.11	.23	.11	-.03	.02	.07	-.09	.20	.26	-.12	-.10	-.07	1.0		
(26) Percent Student Time in Other Nonrelated Activities	.14	.02	.08	.07	-.22	-.23	.16	.01	-.12	-.15	-.03	-.04	-.04	-.02	-.13	-.18	-.05	.21	-.32	-.22	-.12	.14	-.07	.18	.31	1.0	
(27) Percent Teacher Time in Noninteractive Activity	-.12	-.28	-.30	-.02	-.14	-.20	-.12	-.21	-.16	-.21	-.10	-.05	-.08	.12	-.02	.06	-.12	-.03	.07	.08	.17	.24	.01	.40	.12	.26	1.0
VECTOR OF STANDARD DEVIATIONS	0.88	1.30	1.01	9.3	10.0	18.2	14.6	5.6	10.0	13.2	12.8	10.0	1.65	1.55	1.44	2.76	2.15	0.94	0.78	1.92	5.5	3.8	3.1	5.6	2.3	1.8	5.7